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STURTEVANT'S PRESSURE BLOWERS.

We present herewith an illustration of Sturtevant's Pressure Blower, intended for forges and foundries, and claimed to be superior to the old style blowers. Unlike others, the fan is hung on the centre, requiring not much power and removing, to a great extent, the liability to get out of order. One of the principal benefits of its peculiar form of construction is the economy of power insured, in which it is claimed to surpass the fan blower. In the first place most of the friction in the air is avoided, and what friction does occur is used for increasing the blast, thereby saving all of the power; secondly, the air is not made to rotate as fast as the wheel does, avoiding waste in that point. These two principles of economy being perfected and properly combined, there is no waste of power; the question being one of mechanical construction, to insure a good degree of durability. The reasons why strong blast cannot be obtained from fan blowers are, first: They waste power badly, owing to the absence of all scientific principles in the mode of construction. Secondly: They are very poorly made, not possessing much durability if driven at a rapid speed. The fan gives a rotary motion to a body of air contained in a shell with a small outlet at one side. The rotary motion imparts a centrifugal force to the air in the shell, causing it to seek an outlet through which the wind leaves the blower. By this arrangement the power is wasted, first, by means of the friction on the shell, by causing the air to move so rapidly in contact with the stationary part of the blower; and secondly, by means of the rapid motion which is necessary to produce sufficient centrifugal force for blowing. Dead air is caught up by the fan and made to travel, say 15,000 feet per minute, requiring much power to overcome the dead weight of it, as the moving air is constantly leaving the fan and being replaced by dead weight, requiring a fresh supply of power at each revolution.

Many persons know by experience the difficulties of running two belts on a blower, the enumeration of which is not necessary. To obviate all these a bed-piece is added, on which the blower can be moved by a screw in the direction to tighten the belts while it is running, and the belts kept of equal length and tightness, and not be subject to the unskillful care of the melter, or any one else. The belts should be cemented, and riveted or sewed, and not laced at all; and by stretching them by the screw, they will both keep alike and run even and steady. Those using the beds speak in the highest terms of their utility. Another important point is, that the belts are not so much neglected where men have the means of tightening, without cutting or relacing. In Fig. 1 we have an exterior view of the blower, and in Fig. 2 a sectional view, showing its arrangements. The oil, after being poured into the oil cup, at the outer ends of the bearings, is conducted by wicking through the steel set-screws, and after oiling the ends of shaft and set-screws, it passes into the bearing, the whole of it being forced through from one end to the other. The waste oil on leaving the pulley is caught within a hollow flange, and conducted through a tube into the waste cups, where it may be easily removed by the waste cocks at the bottom.

FIG. 1.

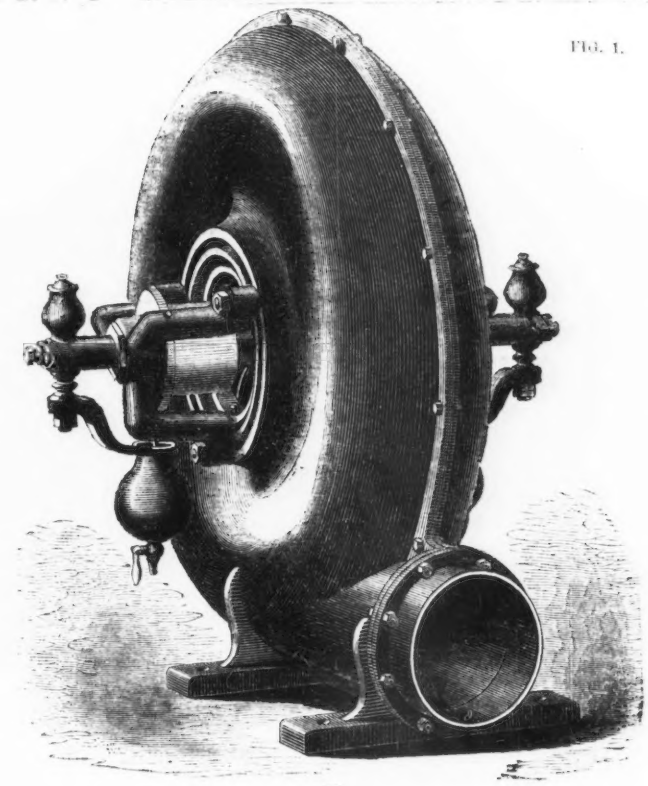
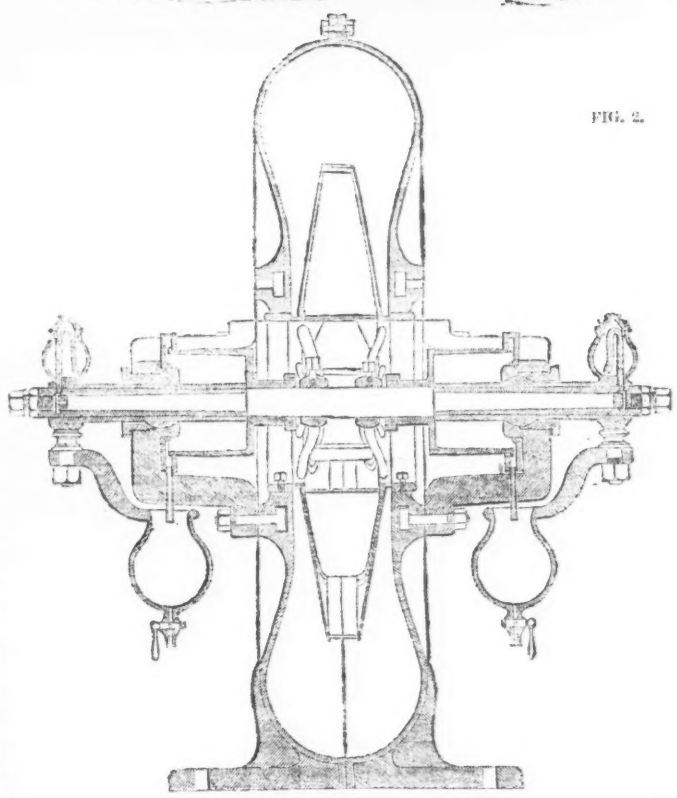


FIG. 2.



STURTEVANT'S PRESSURE BLOWERS.

The great obstacle which has to be met with in introducing these blowers is the bad manner in which they are often set up. In the first place the pulleys on the blowers (which will be seen in looking at the list of sizes) are very large in diameter, with narrow face. This is necessary to enable the blower to run with narrow light belts which will run the blower without pulling hard on the bearings, creating undue friction and wear. To enable such belts to drive the blower with sufficient force, it is necessary that they should run over driving pulleys of large diameters, from six to eight times the diameter of the blower pulley; and in no case should the third or small pulleys on the countershaft be less than one-third the diameter of the large driving pulleys. If double belts are used for driving the countershaft, the width should be about the same as the diameter of the blower pulley. The object in making the pulleys so large in diameter, the countershaft bearings so small, and the main belts so heavy, is to make the blower run up to its full speed without slipping the belts, and to waste as little power as possible by friction on the journals.

The reputation of this blower has become thoroughly established among all who are familiar with its construction and operation: and has received thousands of flattering testimonials from all quarters. Walters & Leonard, 58 John street are the sole agents, to whom all communications, should be addressed.

Quartz Working.

California has been flooded with machinery for working quartz, and yet if all the mills were closely examined a great similarity will be found in the principle on which the machinery is constructed. The running of the old stamp and the grinding of the Mexican arasta are worked upon the same theory as nearly all of our new machinery. Other machines have been invented, but generally they have been laid away after experimenting, as useless. We now learn that Varney, the inventor of a pan which is used by miners to some extent, has invented a new grinder or mill, for which superior merit is claimed, and especially to those who operate with small capital. The mill consists of a hollow outer cone with a solid cone working inside. The pan is bell shaped and about three feet in diameter. The *Alta* in describing it, says: "It is to its peculiar shape that it owes its easy and perfect pulverization. The cone is made up of moveable strips of chilled iron, alternating with thin slips of wood, which keep a cutting edge on the iron. At two hundred revolutions to the minute, and with a horse power, it is calculated to grind five tons of hoarsely cracked quartz to impalpable powder, as fine as flour, in twenty-four hours, wet or dry. It is fed from a hopper, and discharges continously. One person can attend several mills. The weight is under two tons; the cost probably $500 at most, and the wear apparently less than in any present known mode of grinding. Any good jaw cracker will break up the rock fine enough for the Varney mill, so that small miners can get a mill complete at a low cost. But mills that have stamps are advised to keep them." In the screens used in working with stamps, those having 5,600 holes are used, and it is claimed for the new mill that it will reduce the quartz in either wet or dry working, to sufficient fineness to run it through a screen having 10,000 holes. As in working quartz the finer the pulp the more gold is saved, this machine is destined to become useful, if it does what is claimed for it. It may be that the mill will wear rapidly, and that the pulp being reduced to such fineness the amalgamation will be retarded by the fineness of the gold. We give these facts in regard to the working of quartz, in order that our mill men may understand the principles of new methods of working quartz, and examine the machinery for themselves. We would not advise any man to tear out or change his process unless he is satisfied by working experiments that he can save more gold. It is the practice of our best miners to prove a machine by trial before adopting it, and this is the only safe plan. If our quartz men would accept every new invitation upon the recommendation of its friends, the process of working in the mill might be revolutionized every day in the year. But that there is room for improvement on the best process now in use we have no doubt, and we fully believe that in a few years the loss of gold will be greatly decreased by improvement in this respect. In regard to quartz working, we would advise mill men to "Prove all things and hold on to that which is good."—*Nevada Transcript.*

Milling in Colorado.

The Central City *Register* has obtained from Mr. Cheney, of Messrs. Cheney & Hall, an interesting record, extending over a period of over seven years, of his experience with a quartz mill. The mill, consisting of nine stamps and a twelve-horse engine, arrived and was erected in Lake Gulch in June,

1860. The *Register* continues: Three stamps have been added, and the battery frame has been repaired three times. The boiler has lately had new flues put in, the engine has had new boxes for the wrists once, and needs it again. Both, with these slight repairs, are as good as ever. The mill has run most of the time on custom quartz. On a small scale as it is, using steam instead of water-power, and with the business to learn on the part of its owners, it has made them a living, paid expenses of wear and tear and running, and cleared $32,000, most of which has been invested in lodes and their working. The stamps weigh 450 lbs., and Mr. Cheney thinks them as heavy as desirable, because they will crush as fast as screens of the proper fineness will deliver the ore. The mill has crushed ore from a great many lodes, but it gives the Bobtail the pre-eminence. During two years it ran on that lode. Mr. Cheney thinks it crushed 3,500 tons of ore, which yielded on an average $50 a ton. The Nottaway furnished richer ore than the Bobtail, but not so much of it. The quartz, to a depth of thirty feet, yielded $100 a ton. On Nos. 2 and 3, on the contrary, they went down thirty feet before they struck pay. Mr. Cheney says this was the richest and heaviest pyrites he ever saw. A cord of it weighed nine tons and 760 lbs. They got $60 to $70 per ton from this pyrites by running the tailings through Freiberg pans. The latter saved as much gold as the stamps. The vein capped at 80 feet in depth, but opened out again 50 feet deeper. About 30 feet of the surface of the Caledonia was sluiced. The mill crushed the headings and tailings from the sluice, getting $60 a ton. It then capped. They went down 95 feet, when the vein opened out 12 or 15 inches. The Williams paid from $20 to $30 a ton; capped 30 feet from the surface: 40 feet deeper the vein opened out to two feet: a mixture of iron, copper, lead, zinc, gold and silver; assays $150 a ton, but worthless with stamps. In 1860 they ran through a good deal of quartz from the Mammoth. The crevice was eight feet wide, and they got from $20 to $35 a ton. They worked down 185 feet, and could make it pay no further. They reluctantly left the shaft with eight feet of pure pyrites in it. Once on the Justice they got 72 ounces of gold from a four days' run with nine stamps. They went down on this to a depth of 80 feet, when it capped. The crevice has varied from three to ten feet in width. It was afterwards sunk 145 feet further, when it came on a two-foot vein of copper and iron pyrites. The mill is now running on refuse rock from the Bobtail. Mr. Cheney is paid $7 a ton for hauling and crushing it, and he makes a profit of $2 a ton. Of course he has to figure closely. He has two men, one for day, and the other for night work. They are paid $2 75 a day each and boarded, and while on duty attend to both the engine and feeding the stamps. Wood costs $7 a cord; 35 tons are crushed per week. Mr. Cheney thinks that 95 per cent. of what he crushes is rock, yet it yields from $11 to $21 a ton, enough, it would seem, to pay for mining, hauling and milling, and leave a slight profit all round. The above statement shows the actual cost of hauling and crushing ore by stamps, under ordinary circumstances, to be $5 a ton. With a larger mill, run by water, this could be materially lightened. Considering the difference in value of coin and currency, it is nearly as cheap as it can be generally done in California with a steam mill.

An Underground River in Ohio.

It is generally known that there exists, about a mile west of Fremont, a remarkable underground stream, with a swift current, and no outlet above the surface of the ground this side of Lake Erie. It was discovered several years ago on a farm north of the Four-Mile House, now owned by widow Scheffer, by a man who was returning from a day's chopping in the woods. In walking over a slightly sunken place, he noticed a hollow sound, and turning, struck the ground with his axe. The axe broke through and disappeared, and never has been heard from since. Further investigation showed a rock about six feet below the surface, with a crevice a foot or more wide, in which water could be seen several feet below. By tracing its course further down and breaking through the crust, the same phenomenon appeared again, and by dropping a piece of wood or other floating substance in the upper aperture, it was soon seen to pass the lower one, showing a strong current. A lead and line, let down to a depth of seventy feet, found no bottom. The supply of water is only slightly affected by drought, and a pump set up in one of the places above mentioned has furnished the purest water to the whole neighborhood during the late dry season. It is certainly quite a remarkable stream.

Original Papers.

ON A THEORY OF GOLD GENESIS.

Being the Substance of a Memoir read to the AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, at the Buffalo meeting, August 1, 1866.

BY PROFESSOR HENRY WURTZ.

Continued from Page 354.

II.—FORM OF DEPOSITION OF THE OCEANIC GOLD.

The above facts being known, there seems to me no difficulty in the way of understanding the indifference to quicksilver of impalpable and invisible gold, both in gossans and in unaltered sulphides, and the necessity of either time, or "scouring," or both, to develop amalgamation thereof in the ordinary way (without sodium); and that no necessity exists for any hypothesis of an unknown compound of gold in the sulphides. The mere fact that simple washing with water, or other mechanical mode of separation, will frequently develop nothing showing golden color or lustre, is readily comprehended on my theory of metallic deposition from solution. I may cite, as an illustration, the curious experiments of FARADAY, on the reduction of auric solutions by phosphorus, which gave gold in a form so impalpable, that the product appeared like a transparent red *solution* of the metal in water, and required an indefinite time to deposit a sediment.

Much further investigation is called for, on the part of chemists, of the habitudes of gold when precipitated by slow reducing agents, and particularly from (both cold and) hot solutions containing metallic sulphates, such as I have supposed the original ocean to have been. Experiments on the precipitation by sulpholydric acid may be regarded as having little or no bearing, if only because of the sulphur which is usually (and in ferric solutions copiously) thrown down in the early stages of the reaction. In *hot* liquids, this agent, according to some, throws down but a mixture of sulphur and metallic gold; and PROUST maintained this to be the case even in *cold* liquids. Other chemists, however, recognize a true auric tersulphide as thrown down in the cold; but it seems a very unstable compound, in this form at least; mere contact with an excess of auric chloride, according to JACQUELAIN (*Comptes Rendus*, 14, 612), gradually forming metallic gold and sulphuric acid. Alkalies also, according to BERZELIUS, react with it and set free metallic gold.

In any case, and according to any theory which involves the deposition of gold—in the genetic stages we have under consideration—from solution by a simple deoxydizing agent, simultaneously with the reduction of dissolved ferric sulphate to a sulphide, it is difficult, from what we know of the reactions of gold, to comprehend how this metal could assume other than the metallic form. The first stage of the reaction would necessarily be a conversion of the ferric to ferrous sulphate, and the reducing power of the latter upon auric solutions is familiar to all chemists.

I have to add further, upon this head, that I have usually found those chemists who are most practically familiar with the examination of auriferous ores to entertain the belief that the gold in the pyrites is metallic. Thus, for example, Dr. JOHN TORREY, U. S. Assayer, whose skill, both as a chemical manipulator and as a microscopist, it is unnecessary for me to assert, informs me that he has generally succeeded, in dissections of rich Colorado pyrites, both mechanically and with the aid of nitric acid, in detecting under the magnifier metallic gold in scales, films, patches, threads, etc. It is now three years since he showed me specimens illustrating this. Even the miners have long been familiar with the fact, that, after panning down the sands from the battery till the grains of pyrites are concentrated together, specks of gold visible under the lens will usually be developed in these by nitric acid.

It is easy to devise crucial tests, applicable to the question of the metallic state of the gold; and two such classes of tests prominently present themselves:—first, the application of a liquid which is solvent of gold, though not of its sulphides; and second, that of a liquid, solvent of the sulphides, though not of the metal. Quicksilver, especially with sodium, I may in fact claim to be a test of the first class, already in common use, and with results entirely confirmatory of the views I submit; but the additional application of some test of the second class will be required by many, and is certainly to be desired.*

It may be proper for me to say that one of the first authorities in Chemical Geology, BISCHOF (*Lehrbuch*, 1855. *Zweiten Bandes, dritte Abtheilung*, page 2053, and onward,) favors the sulphide of gold hypothesis (though not very confidently or positively), assuming also the agents of the introduction o gold in this form into veins to have been solutions of alkaline silicates.

One more point, and a most important one, remains to be considered. In regard to auriferous sulphides, no fact is more prominent than the tendency shown by the gold to crystallize together with the sulphide, *in the same crystal*, and generally, in greater part, in very intimate admixture therewith. As there can scarcely exist a doubt that the precipitation or reduction which gave rise to the crystallization must have been, if not always excessively slow and gradual, yet, in the majority of cases, sufficiently so to admit of a separate aggregation or segregation of the gold under the polarizing influence of its own specific crystallizing forces, it is plain that some antagonistic agency, generating a potent tendency to a different disposition, must have existed. The same remark applies, with equal force, if we suppose the gold to have been deposited as a sulphide, or in other compound form. Here, then, is a general and most salient fact, which must be distinctly generalized under *any* theory of gold-genesis pretending to even approximate completeness. Crystallization of gold separately from the sulphides, as "free gold," has in nearly all districts been found, in depth, to be exceptional; and, moreover, we cannot leave out of question the universal admission, that, where free gold does occur, it is accompanied by the products, (and therefore believed to be itself a product,) of the oxidation of gold-bearing sulphides. It is incumbent on us, therefore, to inquire what that *potent antagonistic tendency* has (or may have) been, which has ever prevented more or less, in the initial deposition of the precious metal from the waters, its individual crystallization or concretion, and has ever bound it up, in greater part, so intimately and essentially, into the very crystallic constitution of its congenital metallic sulphides.

The suggestion I have to submit, to fill up the grave theoretical hiatus I have here indicated, and which I have deemed fit to incorporate into my sixth postulate, as below, will, I trust, be found simpler and easier of conception, and truer to known facts and natural analogies, than any that may be possible under the sulphide of gold hypothesis.

SIXTH POSTULATE.

The Oceanic Gold was at the same time reduced to the metallic form, and its nascent crystallizing molecules arranged themselves, for the most part, under the polarizing influence, or induction, of the immensely predominant mass of the crystalliziug sulphides, isomorphously (or rather homœomorphously) with the latter into (what we call) crystallic or polaric homogeneity.

It is wholly in accord with this postulate, that the sulphides generally recognized as auriferous are those commonly occurring in the regular or monometric forms, and, therefore, actually homœomorphs of gold itself, in its known and common form. Among these, common *iron pyrites* holds of course the first rank; but into the same class fall also *pyrrhotine*, (according to RAMMELSBERG,* though some others, as DANA,† make it hexagonal. It is commonly destitute of cleavage.) *galena, blende, silver glance, copper glance* (in one form, according to both SCHEERER and RAMMELSBERG), *gray copper, (fahlerz,) erubescite, smaltine, cobaltine*, and several monometric sulphides and arsenurets, often found to be auriferous. To these a few monometric *oxides* may probably be added, such as *magnetite* and *chromic iron*.

There are nevertheless other minerals, also often found auriferous, which crystallize in other systems. I may mention particularly two which are exceedingly common, *chalcopyrite* (dimetric‡) and *mispickel* (trimetric) §and it must be conceded that this postulate, in its entirety, may involve the necessity of a subsidiary hypothesis: that of *polymorphism*, not yet proved to exist, on the part of gold. This, however, being now familiar in some other metals, is a supposition not opposed to analogy in the case of gold.‖

The latitude and expansion imparted by multitudes of recently developed facts to the illustrious theory of MITSCHERLICH, render it unnecessary for me, at the present day, to apologize for seriously proposing what would a few years since have been viewed as but a fantastic phase of this theory; that is, a species of *polymeric*, or rather *heteromeric homœomorphism* between an elementary metal on the one side and divers compound metallic sulphides on the other: this theory being no longer reasonably limitable, as formerly believed, to homogeneous crystallization of homologous substances only. More of this, though, hereafter, in a more special shape, as the importance of the subject deserves.

On the other hand, the sulphide of gold hypothesis appears distinctly to demand the still more difficult supposition of very great and complicated kinds and degrees of homœomorphism on the part of auric sulphide; and would introduce in this way grave difficulties and complications into the genetic system I am striving to develope and simplify.

It is nevertheless to be added that this part of my sixth postulate, which appeals for aid to a new expansion of Mitscherich's theory, stands in some measure by itself, and is not at all essential to the integrity of the succeeding links in my theory; though at the same time it possesses, to my mind at least, so great a degree of inherent interest and probability, that I have wished to submit it for consideration in this connection.

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* Since this memoir was presented to the Association, results of experiments made (in Australia) with a test belonging to the second class—one, namely, capable of dissolving the sulphides but not the metal—have been published in the London *Mining Journal* not many months ago. The agent used was a solution of a *hyposulphite*, and the conclusion come to was, that little or none of the gold in the sulphides operated on was in any other than the metallic state.

* Handbuch der Krystallographischen Chemie. 1855, pp. 36 & 37.
† System of Mineralogy, Ed. of 1854, p. 50.

‡ I may, however, point out that the accepted chemical formula of chalcopyrite, adopted by DANA and others, from RAMMELSBERG, includes, as a constituent, that of *copper glance* Cu^2S, which, in one form, as above stated, is monometric; also, that this species is found crystallized together with common monometric pyrites, in indefinite proportions, which would either make the former necessarily dimorphous, or indicate a yet unknown dimetric form of pyrites. Moreover this species is very rarely distinctly cleavable, still more rarely in determinable crystals: and one, if not both the cleavages attributed to it, may possibly be monometric, instead of dimetric. I may add, that there being as yet no case on record of an *auriferous* chalcopyrite actually proved to be dimetric, any evidence against my above hypothesis, deduced from this species, is as yet entirely negative.

§ Occurs also, however, in monometric forms, which have been taken (or possibly mistaken?) for pseudomorphs. The remarks in the note under chalcopyrite, apply also to some extent to this species; though at the same time, there is some reason for supposing an unknown trimetric form of gold. Thus, for instance, among other trimetric species, in which gold is found crystallized together in variable proportions, we have *marcasite, antimony glance, orpiment, graphic tellurium, bismuthine, stephanite (?)* and particularly *hessite:* in which latter the proportion of gold has been found to vary, at one locality (Nagyag) between 0.69 and 18.26 per cent., without variation of specific characters.

‖ I cite here the dimorphism of two of the metals regarded as natural congeners of gold, namely, *palladium* and *iridium*, which assume both monometric and rhombohedral forms; and as additional evidence of the probability of a rhombohedral gold yet unobserved, I would refer to a number of mineral species of that system, in which analyses have indicated gold in varying proportions:—native *antimony* and *arsenic* and, more especially, native *tellurium* and *tellu*ride of bismuth or *tetradymite*. (In these four cases, it will be noted it is not mere homœomorphism which is implicated, but the more direct and absolute evidence afforded by simple isomorphism between elements.) *pyrrhotine* (according to DANA), *polybasite(?)* and *cinnabar*. Among oxides, also, possibly *hematite* and *ilmenite*. In addition to the ordinary monometric forms of native gold crystals, we have reason therefore to anticipate the probable future discovery of other forms belonging to two, if not three other systems; of one of these, the rhombohedral, the evidence being almost positive; of the trimetric less conclusive; and of the dimetric (that of crystallized *chalcopyrite*) barely possible; though as to this latter form, I may point out that there is another well-known dimetric species, *nagyagite*, containing, according to numerous analysts, from 6.5 to 9.5 of gold per 100, with tellurium, lead and sulphur.

GAS-FLAME REACTIONS—VII.

By R. BUNSEN, Professor of Chemistry at the University of Heidelberg. Translated for the AMERICAN JOURNAL OF MINING, by H. ENDEMANN, Ph. D.

Continued from Page 338.

II.—REACTIONS OF THE INDIUM COMPOUNDS.

Indium is most easily and certainly detected with the spectroscope. I give its reactions, therefore, only for the sake of completeness.

a. Flame-Coloring.—Intense pure indigo blue.

b. Metallic Coating.—Black with brown tarnish; sometim

dull, sometimes specular, instantaneously disappearing with nitric acid.

c. Coating of Oxide.—Yellowish white, scarcely visible; giving, with protochloride of tin and nitrate of silver, no reaction.

d. Coating of Iodide.—Likewise yellowish, almost white; with and without ammonia, if the coating is thin, invisible.

e. Coating of Sulphide.—Likewise yellowish, almost white; scarcely visible; unchanged with sulphide of ammonium.

f. Reduction with Soda on the Charcoal rod.—Difficult; produces silver white, ductile globules, slowly soluble in muriatic acid.

In the following table the coatings of the elements thus far considered are comprehensively arranged:

Volatile Elements Obtainable in Coatings by Reduction.

	Metallic coating and Tarnish.	Oxide-coating and Tarnish.	Oxide-coating with Sn Cl.	Oxide-coating with Ag O, NO$_5$ HO.	Oxide-coating with Au Cl, NH$_3$ and NH$_4$ Cl.	Iodide coating with NH$_3$.	Sulphide-coating and Tarnish.	Sulphide-coating with NH$_4$ S.
Te	Black, brown T.	White.	Black.	Black.	White to yellowish.	Brown, temporarily disappearing in breath.	Black to black-brown.	Orange, temporarily disapp.
Zn	Cherry-brick-red T.	do.	Brick-red.	do.	White.	Brown, not entirely disappearing in breath.	Yellow to orange.	Temporarily disappearing.
Sb	Black, brown T.	do.	White.	White.	White.	Orange-red, turning yellow and disapp. when breath.	Orange.	Temporarily disappearing.
As	Black, brown T.	do.	do.	do.	White.	Egg-yellow, temporarily disapp. when blown upon.	Citron-yellow.	do.
Bi	Black-sooty-brown T.	Yellowish white.	do.	do.	Black.	Brick-brown. Each to orange-red T., temporarily disapp. when blown upon.	Timber-brown with coffee-brown T.	Not disapp.
Hg	Gray, not continuous coating.					Morinda-red turns yellow when blown upon. Then disappears.		
Tl	Black, brown T.	White.	White.	White.	White.	Temporarily disappearing with yellow tint when blown upon.	do.	do.
Pb	do.	Bright ochre-yellow.	do.	do.	do.	Citron-yellow, not disappearing when blown upon.	do.	do.
Cd	do.	Black to brown, with white T.	do.	do.	do.	Temporarily disappearing with yellow tint when blown upon.	do.	do.
Sn	do.	White. Yellowish white.	do.	do.	do.	Not disappearing when blown upon.	do.	do.
Cu	do.	do.	do.	do.	Yellowish white.	Brown, temporarily disappearing in breath.	Brownish red to black.	do.
Au	do.	do.	do.	do.	do.	White.	Citron-yellow.	do.
Ag	do.	do.	do.	do.	do.	White.	White.	do.

Substances, the metallic coatings of which are soluble with difficulty in dilute nitric acid.

Substances, the metallic coatings of which are scarcely soluble in dilute nitric acid.

[WRITTEN FOR THE AMERICAN JOURNAL OF MINING]

METALLURGY OF TIN.

BY PROFESSOR DUSSAUCE.

Continued from Page 354.

Treatment of the Crop.—The crop, collected with a shovel, is passed into square buddles or German boxes, 7½ feet long by 2½ to 2½ feet wide. The bottoms are inclined in such a manner that the depth, which is at the head twenty inches, is about twenty-seven inches at the other end. The face, which forms the lower extremity, is pierced with holes, which are closed as fast as the ore accumulates. At the head is a trough into which a trench conducts the ore mixed with water. The ore passes through the grate which forms the bottom of the trough, and runs upon an inclined table, over which it is distributed by means of slats disposed like a fan. Here, as in the first concentration, the ore is separated, according to its gravity, in three classes: the very rich, which stays at the head; the rough sands (poor) which stop at the end; and the slimes which run away. Since a few years ago a more perfect apparatus, called the round buddle, has been substituted for the ordinary buddle. It is a kind of round vat, the masonry bottom of which presents a conical form, with an inclination of one-twelfth. At the top of this cone is a pivot, carrying two horizontal wooden arms, each of which supports a little shutter with automatic suspension, or piece of broom between two boards. Over the centre of the pivot is a cast iron hopper, the bottom of which is pierced with four holes. A stream of water brings the ore into this hopper, through the bottom of which it is spread over the surface of the cone, constantly stirred by the shutters, to which a circular movement is given. The different classes of ore are soon divided in the same manner as in the square buddle.

After this first concentration, the ore is submitted to a second. For this purpose a vat is three-quarters filled with water; then a man throws into it a shovelful of concentrated ore, while another constantly stirs the liquid. The addition of ore is repeated until the vat is half full, when it is left to settle. In this manner three new classes are obtained: the *top skimmings*, which are treated with the slimes; the *bottom skimmings*, which are sent back to the buddles: and the bottom, which consists of ore nearly pure, is called *tin-stuffs*, and is ready for chemical treatment.

Treatment of the Roughs.—The rough sands from these operations are passed into new ditches, at the head of which enters a stream of water. In this stream a shovelful of sand is thrown, which, carried down the inclined plane, leaves a small quantity of rich sand which is added to the *crop;* poorer slimes separate farther down; then some sands, still poorer, but rich enough for treatment, called *crazes*, which are treated as new ore; and lastly, the final tailings, which are thrown away.

The Slimes.—As for the slimes, their treatment is very delicate: since they contain a large quantity of rich ore in very fine powder. The substance is classified in a series of successive operations, first in buddles, then in troughs, in which paddles moving slowly in the middle of the water, keep in suspension the lightest parts, while the heaviest parts settle; and, lastly, by washing the richest products of the preceding operations on tables of various forms. The most simple of these is a wooden table inclined one-sixteenth, twelve to fifteen feet long, and five to six inches wide, provided with edges. The ore is thrown in at the head of the table, and washed by a stream of water of accurately calculated amount, which carries off the useless slimes, while the rich ore is constantly brought back to the head with brushes, and soon accumulates there. When the operation is finished, the table is turned over, and the concentrated ore is poured into compartments corresponding to the different degrees of density, and consequently of purity.

Chemical Preparation.—During the mechanical treatment we have described, the *crop*, the *roughs*, and the *slimes*, are successively freed from the stony substances with which the oxide of tin was mixed, and the gravity of which scarcely reaches 2.; but while the ore has thus been enriched, the metallic impurities, the density of which is nearly the same as that of oxidized tin, have at the same time accumulated; and different metallic sulphurets (principally mispickel and wolfram) are abundant in the concentrated ores. The elimination of those substances takes place in the following manner:

Roasting.—The object of this operation is to carry off the largest part of the sulphur and arsenic, in the shape of sulphurous and arsenious acid, and to transform the heavy arsenarets and sulphurets into oxides, light sulphates and arseniates, easily to be removed by washing. Generally, roasting takes place in an ordinary reverberatory furnace, communicating with a large condensing-chamber, separated into four or five compartments, in which the arsenious acid is deposited. The upper part of the furnace is used to dry the ore. When well dried it is allowed to fall on the same floor, and there it is gradually heated, while the mass is constantly stirred, and from time to time a little quantity of powdered charcoal is added to facilitate the decomposition of the arsenio-sulphides.

The large English establishments have adopted now for this operation the furnace of Brunton, with a revolving bottom. This furnace is called *Brunton's Calciner*. It represents an ordinary reverberatory furnace, with a hopper carried to the centre of the roof, by which the ore is thrown in. The usual floor is substituted by a conical cast-iron platform, connected, by means of a pivot, with a series of machinery which communicates to it a slow movement (one turn in forty minutes). To the ceiling of the furnace is fixed a rake which is nearly in contact with the bottom, and which stirs the ore and changes the surface exposed. Little by little, the ore descends, and following the revolution of the cone, is roasted and transformed into oxides of a yellowish brown color, and escapes of itself by an opening at the base of the apparatus.

Elimination of the Wolfram.—They use in England, since 1858, a method which effects the complete elimination of all the tungsten contained in certain ores, and consequently the production of tin in a very pure state. This process is practiced as follows: The ore is mixed with a determined quantity of sulphate of soda, according to the tungsten it contains, and then introduced into a reverberatory furnace, in which it is kept at a dark red heat until the mass assumes a pasty appearance. At first, the flame must be very reductive; sometimes, even small quantities of charcoal are added, so as to favor the decomposition of the sulphate of soda. The whole is stirred from time to time, until the substance has lost all its phosphorescence; the flame is then rendered oxydizing till the end of the operation.

Washing of the Roasted Ore.—The ore, after washing, whether treated or not with an alkaline compound, to carry off the tungsten, is submitted to new washings, destined to remove all the light oxides it contains. These washings vary, according to the degree of fineness of the substance. Sometimes it is sufficient to submit it to the action of a stream of water on metallic sieves; most frequently it is passed into the buddles and tyes: sometimes (and this is the case when it contains wolfram) it has, before washing, to be passed through the stamping machine. The water used to carry the oxide of tin constitutes, in that case, a solution of tungstate of soda, which is collected and concentrated. This manner of operating permits the English manufacturers to sell at a low price the tungstate of soda, for calico printing, the fabrication of steel, and the preparation of incombustible tissues. When the ore of tin is highly cupriferous, it is left, after roasting, exposed for some time to the air; then the waters are carefully collected and treated with iron to obtain cementation copper.

Preparation by Acids.—Since 1812, the use of sulphuric and hydrochloric acids has been proposed to purify ores of tin after roasting; but this process does not seem to have received much development. These acids, however, appear to dissolve and thus remove the oxides of iron and copper more easily and more completely than any mechanical operation. Hydrochloric acid is preferred when the impurities are of a ferruginous kind, and sulphuric acid when they are of copper.

TO BE CONTINUED.

Mining Summary.

GOLD AND SILVER.

Nevada.

The Comstock.—The San Francisco *Bulletin*, Nov. 15, says: The mining share market presented no new feature this week until near the close, when quite encouraging information was received from several claims on the Comstock lode. This is producing a reaction in the market, and most descriptions show an upward tendency; however, some "shorts" being required to fill contributed somewhat to the advance. A much better feeling prevails, and we would not be surprised to see a greatly improved market at an early day. Crown Point has been for the most part inactive, opening at $510, then selling at $610, assessment delinquent, and at the close $570 is bid. Hale & Norcross exhibited considerable improvement early in the week, rising from $840 to $900, seller 3, gradually receding to $760, then selling at $775, and closing at $860. The actual bullion product for the month of October was $49,980. Gould & Curry has been in limited request during the past week, improving from $290 to $375, declining to $310, rising to $400, seller 5, and closing at $365, seller 30. Chollar-Potosi has been less active, at declining rates, opening at $125@130, receding to $118, and closing at $128. The yield of bullion in October amounted to $165,000, against $252,900 in September. Savage continues quite active, selling within a range of $95@107 50, then at $91, and closing at $106. Kentuck has been freely dealt in, advancing from $123 to $141, declining to $123, rising to $149, seller 30, and closing yesterday at $137. Receipts for the month of October $105,526 65. Imperial has been largely dealt in under a rapid advance, improving from $138 50 to $165, and closing on the 15th at $155. The average daily product of ore—120 tons from the Alta and 40 tons from the Holmes mine. Yellow Jacket opened at $350@375, then sold at $460, assessment of $100 per foot delinquent, and closed at $382 50. Empire advanced to $190 and closed at $175. Overman advanced from $44 to $48, declined to $42 50, and closed at $44. This mine at present yields about 60 tons of low grade ore per day. Belcher sold at $120@123, then at $105, and at the close $120 is bid. Confidence was in the market at $36, seller 3. Gold Hill Quartz has advanced to $93 per share. Bullion sold at 6@8; at the close we quote it at $6 bid and $8 asked. Segregated Belcher brought $3 50. De Soto $5. We quote Sierra Nevada at $6 bid and $7 asked.

Reese River District.—The Austin *Reveille*, Nov. 21, thus speaks of the Plymouth company's project of sinking a general working shaft for the thorough and economical development of their property on Lander Hill: A considerable part of the ore taken from the Kalesced a short time ago, was of as good a quality as was ever had from the surface of any mine on Lander hill, and the situation and appearance of all the ledges warranted operations on an extended scale. A point was selected for the shaft 350 to 400 feet above the group of ledges, and the work was commenced. The shaft is four by eight feet in the clear, and is now 191 feet deep. It is substantially timbered. The last thirty feet sunk in the shaft were through an extremely hard, tough granite, but there are good prospects of soon striking a vein and better rock. Since the shaft was commenced four distinct ledges have been cut through. The third ledge was cut at the depth of 133 feet, and the fourth at the depth of 152 feet; the dip of the former is 32° and of the latter 40°. The lower vein is of good size and appearance, and holds some excellent ore. Two of the veins cut in the shaft have been claimed by the company, and applications have been made for patents. The position of the shaft of the Plymouth company justifies the belief that many ledges will be cut long before it reaches the depth of 500 feet. It forms one of a valuable group to which the Florida, Magnolia, and Troy belong, and is separated from the works of the Fuller, Manhattan company, South American, and Savannah, by a shallow ravine. The small area covered by the works of those companies is now the busiest and most productive on Lander hill, and from all appearances not one of them has prospects of success and remuneration superior to those possessed by the Plymouth. The shaft was undertaken with the determination of developing the property in a thorough and systematic manner, and if the plan is carried out patiently it must result in great success and profit. Hitherto the owners of mining property have been too impatient, and looked for the fruit before the seed had time to germinate. In silver mining it is admirable policy to hope and wait. No great plan of mining, at all likely to be successful, can be carried out without intelligence, skill, patience, time-

and ample capital.....The little Troy—one of a group of valuable mines on Lander hill is, according to the *Reveille*, of the 15th ult., producing ore of extraordinary richness. Ten tons were reduced at the California mill last week, which yielded by assays of the pulp at the rate of $381 75 per ton. The Troy is opened through an incline to the depth of 375 feet, along which a small compact vein holds a fine quality of ore. It is a parallel vein to the Florida, both in its course, size, appearance, and character of mineral.

Pahranagat.—There is a little excitement in relation to the discovery of gold at Pahranagat. The editor of the Belmont *Reporter* saw a person from there who informed him that several ledges of quartz, showing gold, had been found two and a half miles east of Hiko, and that considerable excitement prevailed. The *Reporter* says: Our informant panned out several bands full of dirt from the debris of the lodes, and obtained about a dozen flakes of gold. As a result of this discovery enthusiastic individuals are building immense air-castles, and talk of the immediate erection of mills, and anticipate the speedy building of mints and the coming of railroads. From a slight personal knowledge of the locality of this reputed gold discovery, we are constrained to believe that it cannot be extensive, and that the prevailing excitement with regard to it will only have an ephemeral local existence.

Newark District.—Persons who have arrived here within the last few days from the Newark district, speak in flattering terms of its prospects, says the Austin *Reveille*, Nov. 25. The fine twenty-stamp mill of the Centenary company, with its complement of roasting furnaces, was opened on the 18th ult., with every indication of complete success. There was a plentiful supply of good ore waiting reduction. The Chihuahua ledge—the principal mine of the company in this district—is among the most promising in Lander county. In the deepest excavations the vein is broad, compact, and carrying a large proportion of valuable ore, and our informant believes it can be soon put in a condition to furnish a full supply of ore for the mill.

Silver Bend District.—The El Dorado is one of the great ledges of the Silver Bend District. According to the Belmont *Reporter*, at the depth of 104 feet in the incline, about 60 feet perpendicular, a stratum fifteen inches wide was uncovered, selected specimens of which gave by assay $2,802 32 of silver per ton. The ledge has not been cut through in the incline, but it is known to be very wide.

Washington District.—We learned yesterday, says the Austin *Reveille*, Nov. 19, that the negotiation for the transfer of the Santa Elena property in the district of Washington have been concluded, and all the property—mines, houses, etc.—is now in possession of the agent of a New York company. It is the intention of the present owners to erect immediately extensive smelting works for the reduction of the ore produced by the Santa Elena and other veins bearing rich galena. The district possesses great facilities for that kind of reduction works. There is no district in the central part of the State in which the growth of timber is so heavy, and pine, cedar, and the mountain mahogany are found in every canon and ravine, and on every hill side and mountain summit. The mahogany yields a superior charcoal: the weight of a bushel of it being thirty-five pounds, while the coal produced from the nut pine weighs only seventeen pounds. At the present time and for a number of years the best quality of charcoal could be delivered at the works at the small cost of 20 cents a bushel; and we have been informed that parties were ready to contract for its delivery at 15 cents a bushel. With cheap fuel assured there can be no obstacle in the way of the success of the plan of smelting the galena ores of the district. Materials for building furnaces are very abundant. Water is plentiful, there being a number of perennial springs which supply several large creeks. The facilities of the district of Washington may be summed up thus: plenty of good ore, abundant materials for furnaces, cheap fuel, and an unfailing supply of water. Now that the Santa Elena property has passed into the hands of a wealthy company, with the ability and will to develope it, there would appear to be no reasonable doubt of the future of Washington district.

Reveille District.—A gentleman lately arrived from this district reports to the *Reveille*, the usual success in obtaining large amounts of silver from the ores there mined. Eight tons of ore from the Sweepstakes mine were lately hauled to the mill at Hot Creek. One ton of this being first class yielded $900; the balance had not been worked, but was estimated at over $200 per ton. Seven tons were taken from the Davis lode to the same mill, producing an aggregate of $987, or $141 per ton. The first class ore produced $708 per ton. There are but few miners now in the district, but these are profitably engaged in gathering ore which is taken either to Hot Creek or Austin for reduction. This is certainly mining under difficulties. The two mills at Hot Creek are kept at work: that of the Consolidation company on tailings of its former workings, and the mill of the Old Dominion company on the company's own and custom ore. Sixty-five tons of ore from Money district were lately worked at the latter mill which gave the excellent average of $171 per ton, and it is understood that the ledge from which it was taken was a large one, and all through it the ore is equally good.....Eight tons of ore from a ledge called the Sweepstakes, were recently reduced with the following result: 1 ton of first class ore yielded $900, and 7 tons of second class $2,800—at the rate of $400 per ton.

Miscellaneous.—Coover's mill at Bunker Hill district sent to Austin on the 20th ult., 3,079 ounces of crude bullion.....The roasting furnaces of the Old Dominion mill at Hot Creek, are completed, and the mill will now produce bullion to the full extent of its capacity. The Old Dominion mine will soon be in a condition to produce sufficient ore for the supply of the mill.....Recently 10 tons of ore from the Buckeye mine in Summit canon, district of North Twin river, were reduced at the Mettacom mill, with the following hand-some result. 7 tons of chloride ore gave a pulp assay of $241 per ton, and 3 tons of sulphuret ore at the rate of $231 per ton.....In six days the Long Island mill, with a battery of five stamps and two roasting furnaces, produced bullion to the value of $7,000. The ore reduced was from the Tiemoke mine, and was evidently of a very high grade.....There were received at the assay office of the Manhattan mill, for the week ending Saturday, 16th ult., 16,109 ounces of crude bullion for melting and assay.....2,326 ounces of bullion from the Knickerbocker mill near Ione, arrived at Austin on the 16th ult., on the 18th ult. a bar weighing 1,535 ounces arrived . . On the 19th ult. 3,200 ounces of bullion arrived from the Old Dominion mill at Hot Creek.....On the 23d ult. 8,099 ounces arrived from San Antonio.

Colorado.

We have the *Denver News* of Dec. 4. Governor Frank Hall, in his annual message to the Territorial Legislature, says:

Mining, our great industry, the foundation upon which rests our whole business prosperity, has, during the past year, yielded to well-directed labor most satisfactory returns. This encouraging result is partly due to a vigorous working of long-abandoned lodes and placers to the exclusion of the exciting search for new mines, which in former years so generally diverted the efforts of the miner by the alluring hope of sudden wealth, but mainly to the introduction of new machinery and methods adapted to the proper treatment of refractory ores. These processes seem to embrace all the chemical and mechanical appliances necessary for the certain and economical extraction of the precious metals from their matrices, having given under sufficiently practical tests with all varieties of ores the most gratifying results. We may confidently look forward to a period in the not very remote future, when we shall be able to obtain gold, silver and copper from the abundant material in which our mountains abound, to an extent practically limited only by the amount of machinery and capital employed for those purposes. The discovery and partial development of numerous and surprisingly rich silver mines in the vicinity of Georgetown, in Clear Creek County, during the past year, offers a fresh guarantee of diversity of labor and in increased production of wealth in the brightening future. Under the act of Congress, approved July 26, 1866, the mineral lands of the United States, surveyed and unsurveyed, are laid open to preemption and occupation—pursuant to certain prescribed regulations—by citizens of the United States and those who have declared their intention to become such. Since the passage of this act, a multitude of applications for government titles to mines have been filed in the land office at Denver, but the Surveyor-General having found no one until a very recent date who would accept the contract to establish meridian lines within the mining districts, owing to the inadequate pay allowed by law for such service, but one final survey has been made. This first location by the filing of an adverse claim under the provisions of section six of the Congressional act, which authorizes parties having adverse claims to file them at any time prior to the approval of the survey, has been duly prepared by the agents of the general government and forwarded to the interior department to be submitted as a test case, demanding such adjudication as will establish a reliable precedent for the guidance of future decisions. This proceeding will necessarily suggest by its thorough investigation, beneficial amendments to the law, which, as it now stands, is practically inoperative in such cases. When there are no adverse claims its operation is rapid and complete, but when complications exist arising from inaccurate surveys, multiplicity of local titles, or the causes before stated, the law does not clearly delegate to any established tribunal the power to adjust them, or, if it does, the meaning is so obscure as to obstruct most effectually every step taken to the permanent and definite establishment of the rights of parties litigant. The case now pending will, doubtless, develop the hidden construction which is to determine future action. General Lessing has kindly furnished me with the following account of surveys made to facilitate locations under the act referred to: The first correction line south has been run from the base of the mountains near Bradford, west eighteen miles. The second correction line south extends from a point on the divide near the head waters of the Plum and Monument creeks at the foot of the mountains, west through the South Park, to a point on the Arkansas river, about two miles north of Twin Lakes. The line passes twelve miles north of the salt works of Park county and six miles south of Fairplay. The ninth guide meridian has been run from the second correction line south, from a point on the eastern border of the South Park, north, to a point twelve miles north of the base line, the latter passing about one-half mile east of Idaho, through the Briggs mill, between Central and Black Hawk, to South Boulder and Columbia City. The base line is also extended one and a half miles beyond Blue river. The exterior line of township three south, range seventy-three west, are established, taking in the lane and mining claims to a point six miles above Idaho. The Surveyor-General has authorized the survey of mineral lands lines. Within the limits described are embraced nearly all of the mining districts of Boulder, Gilpin, and Clear Creek counties. Empire and Georgetown though now excluded, will receive early attention, the townships in which they are located be defined, and the people enabled to assume their legal prerogative as in other jurisdictions covered by the congressional statute. During the year, the various interests of Colorado have been admirably represented at the Universal Exposition in Paris. In the fall of 1866, a large and valuable collection of minerals was made for this purpose by Geo. W. Maynard, Esq., who was subsequently appointed territorial commissioner; but events transpiring shortly afterward to prevent his contemplated tour through Europe, J. P. Whitney, a gentleman of fine attainments, and possessing a thorough practical knowledge of our country, was appointed to the vacancy. It is impossible to over-estimate the value of service rendered the territory through the indefatigable energy of Commissioner Whitney. His return in October last was hailed with universal manifestations of appreciation and esteem. When we consider all that has been accomplished by his almost unaided efforts, at great personal sacrifice and a large burden of expense in which we have borne no share, the inestimable results likely to accrue in connection with the future welfare of the territory, it is eminently proper for this assembly to deliberate upon some fitting testimonial of the estimation in which this service is held; and I would therefore suggest the adoption of a series of complimentary resolutions expressive of the same, a copy of which engrossed on parchment to be presented to Mr. Whitney in the name of this commonwealth.....The Central City *Register*, Dec. 3, has the following items: Mr. Fisk's Davenport ore produced about one ounce of gold to the ton, at the Keith mill.....The banks of Central have bought and shipped during the last week, 974 ounces of gold, at $20 an ounce, $19,480.....The Black Hawk company cleaned up 320 ounces of gold last week, worth in round numbers $7,000. Pretty handsome week's work for a "played out" mining company.....

Mr. F. N. Dubois and Prof. Adolph Behr have made arrangements to operate the Keith mill, they taking it next week, and carrying out with it, as soon as they can, the programme of the mill which burned down.....Junction lode, situated near the head of Willow creek, between Democrat and Columbia mountains, Georgetown, is supposed to be the Nuckolls and Mexican one. Two tons of the ore or quartz, unselected, yielded to the Freiberg process $100 a ton.....Silver Eagle is one of the lodes on Brown Mountain, Georgetown. From a shaft twelve feet deep two tons of ore was taken, which assayed $229, and yielded in Garrott & Martine's mill, $219.04 per ton.....Mr. Calvin Kinney is ready to start his stamps and furnace, located on the bar next above Downieville, under the young America lode.....The Central City *Times* of the 22d ult., has the following in regard to a dispute about the Hoosier lode: A gentleman, just returned from Boulder city, reports that 25 men from "Jim" creek recently came over into Four Mile and dispossessed the original claimants to the Hoosier lode. The Hoosier was first recorded in 1861, the claimants sinking a few feet thereon. Nothing more was done until this summer, when Cobb and some other "Jim" creek miners sank a shaft on it to the depth of 15 feet, opening up from three to four feet of sulphurets of silver, reported to yield by assay in the neighborhood of $300 to the ton. The original owners hearing of it come and took possession, whether by superior force or during the absence of Cobb and party we are not informed. The "Jim" creek men have since came over the hills in force, turned the others off and are now in possession. There is considerable excitement about it in the district.....Also the following: The new celebrated Hoosier lode in Four Mile district is discribed as having very peculiar vein rock. The lode or ledge crops boldly out from the surface and is a kind of hard, barren-looking, flinty limestone. It can be plainly traced for a long distance over the surface of the ground. Scarcely anyone would dream of sinking on such lodes for mineral; but it appears that this white, flinty rock is often the cap or covering of valuable silver ores. Since this pocket of rich sulphurets was struck in the Hoosier, attention has been drawn to the very large ledges of the same discription of rock that abound in Ward district, and notably on the hill on which the Ni-Wot mill and the Columbia lode are situated. Henry and Haswell, after seeing the "Hoosier," decided on prospecting one of these same neglected lodes, and after getting down a few feet they have found silver ore, similar to the Hoosier, making into the shaft. This discovery has caused great excitement in Ward district, and the lode has been traced and staked off for 2,000 lineal feet. There are several other well-defined ledges of the same rock in Ward, and the miners are rapidly "going for" them.....The amount of gold sent East by Wells, Fargo & Co. from this city, for the week ending the 20th inst., is $27,840, currency valuation; of which the Rocky Mountain Bank sent $15,000; Warren Hussey & Co., $6,840.....The *Register*, 26th ult., says that the new nine-stamp mill recently purchased by Messrs. Kellogg & Royal, at their mines in Granite district, is now being made ready to commence work upon the Amizeti lode.....The Montgomery *Miner* says: Col. Baldwin has found the crevice of the Huldah, on Kelso mountain, near the Baker. An adit was run in eighty feet, then a cross-cut carried north twenty-eight feet, striking about three feet of ore which assays way up in the hundreds. Gen. Marshall and others have projected a tunnel running from Leavenworth creek west into Leavenworth mountain 3,000 feet, cutting at right angles the Bulldog, Allen, Chas. H. Marshall, W. H. Beatty, Virginia, Equator, and Compass & Square lodes, half of each of which belong to the tunnel company. That's the right way to go at it on those steep high mountains. The Smelting Works have run out $5,283,00 in silver in about three weeks. It is from the Equator.....Persons are at work on the Rise, Hartwell, Roe, Hercules, Herkimer, White, Junction, and Wm. Penn lodes, with generally encouraging prospects.....Mr. John Shock, of Summit county, says the Gold Run Ditch company have taken out in five seasons, working an average of 100 days, exclusive of Sundays, repairs of ditches, works, etc., $140,000 worth of gold dust, rating it at $18 an ounce. During this time they have built 3,200 feet of flume, having previously dug a ditch nine miles long to bring water.

Arizona.

A correspondent of the San Francisco *Bulletin* writing from Fort Yuma—a town situated on the Colorado river, about 170 miles from its mouth—gives some sensible advice relative to the navigation of that river, and also touching the best mode of supplying the southern portion of Arizona territory. His closing remarks, in reference to the state of society there, are not very flattering, but are doubtless too true. He writes: I learn that already steps are being taken by some of the public-spirited merchants of San Francisco to test the question of navigating the Colorado. Before any financial sacrifices are to be made, I would respectfully suggest that a committee of gentlemen of science, and commercial training and education be appointed, to proceed to the mouth of the Colorado and take passage up the river as far as possible, and return during low water, and then repeat the trip during a high stage of the river. This examination of the river, and the style of craft adapted to its navigation, would at once remove all doubts as to the policy of establishing steam communication between the Gulf of California and Callville, so far as the safety of the boats and their cargoes are concerned. As the navigation of the Colorado is known to be a success as far up as La Paz and Hardyville, the question resolves itself as to the feasibility of its being navigated between the latter place and Callville. If its positive feasibility is declared, then the committee should be called upon to make representations regarding the people, the country and the signs of its future development, etc., and should ascertain if the country above Hardyville will support the establishment of a line of boats that will cost $100,000 to commence it. Laying aside altogether the question of supplying Salt Lake City and its neighborhood, which is simply ridiculous, is there not a vast amount of country in the southern portion of Utah and the northern part of Arizona, teeming with mountains of precious minerals, and containing hundreds of thousands of acres of land susceptible of the highest degree of cultivation, and capable of maintaining a large population? I think so. Certainly, if this is not the case, it is a most popular error, and should be forever corrected by the selection of competent persons to examine the subject and pass judgment. In connection with this matter, there is one question admissible of no doubt, and that is that if the Colorado is susceptible of safe and regular navigation, a company should be organized, money advanced, and a line of substantial boats put upon the river at once. While upon the subject of navigation, and of the best mode of supplying this country, I would call attention to the fact that certain parties are at present under contract to supply government stations in southern Arizona through the Gulf of California and the Mexican port of La Libertad. This place is nearly 209 miles from Tucson, (the most central and the largest place in southern Arizona,) and seems to be the most conveniently situated one upon the southern coast with which to open communication with Arizona and New Mexico. It would seem that nature had indicated this place as the point of ingress and egress for southern Arizona in particular; and it is to be hoped that ere long the government will discover the vast importance of possessing La Libertad either by the purchase of Sonora or by a permanent treaty. Since the contract has been made by the government to have its supplies taken to Tucson *via* Libertad, at less than one-half the cost of former transportation, would it not be well for the government officers at Albuquerque and other places in New Mexico to look this way for a portion, if not all, of their supplies? The distance either from the Mississippi river, *via* Fort Riley, or from the Bay of Matagorda, Texas, to Albuquerque, is nearly twice as far as that from Libertad to Albuquerque, and more difficult and dangerous, while a large portion of the supplies, especially flour, vegetables, salt and pork, can be purchased cheaper and in fresher and better condition upon the Pacific coast than in the East. In the case of Indian troubles and protracting struggles in New Mexico and Arizona, which are believed to be inevitable, the government would save millions of dollars by purchasing Sonora, even at a high price. There can be no question regarding the untold wealth that lies buried in the mountains of Utah, Arizona and Sonora. And it is contrary to the laws of nature that the concealment of the precious metals should be permanent. It is also true that the territories all contain arable plains and valleys, and that all the necessaries of life that grow out of the ground may be cultivated and raised with success. The two great things necessary at present are commerce and population. Establish the former and the latter follows as a consequence. Establish successful and regular steam navigation with Callville and with La Libertad, or with Guaymas, or both, and the entire country will experience a new existence. Southern Arizona and Sonora will be particularly benefitted by the opening of some gulf port. Be it remembered that Tucson itself is surrounded by copper and silver mines that might then be worked with great success. As a whole people, the residents of this Territory would be a little more prosperous, and infinitely more happy, if they would pull a little more together, and eject, if not from their Territory, at least from their mercantile and social circles, a set of illiterate, indolent, grasping, grumbling, thankless lot of adventurers. I spent ninety days in Arizona last winter and spring; and traveling, as I did, all over the northern and southern portions of the Territory, with unbounded facilities for seeing and studying the people, I took the advantage afforded me of making the most minute observations. I met in Prescott at least a dozen men who pretended to own mines in that locality, and who held them for sale at prices ranging from $20,000 to $200,000. These fellows, with a famishing look and with a sign of distress sticking out of the seat of their breeches, will tell you that their claims are as rich as the famous Washoe lode, and that before they will sacri-

fice themselves as Comstock did, they will starve. One man remarked to me, in conversation about a mine he held for sale at $2,500, that he preferred starvation rather than part with it for less—and he was desperately near starvation point when he made the illiterate declaration. There are a collection of just such characters in every town of note in Arizona Territory. They have, or pretend to have, some gold, silver or copper mines, which they put up for sale at an extravagant price, and being too lazy to work, and too poor to get out of town, they eke out a miserable life in rum shops, just hypothecating enough of their undeveloped stock to keep their ricketty bodies and souls together. This is a correct representation of one class of men in Arizona Territory. I suppose there is some real good cause for a Lytle grumbling on the part of the people of Arizona Territory. About Prescott the dread Apache seems to have things very much his own way, and will have so long as it remains fashionable to permit savages to massacre whole communities and then make peace on their own terms. Besides, the troops sent out to this coast, for the most part are professional thieves and highwaymen, and those who do not desert before arriving at their place of destination manage to effect their release from the service shortly afterward. In the neighborhood of Tucson and Tubac the Apaches make an occasional visit. The residents of these towns, however, are ever on the alert for the red devils, and their incursions are few and far between. New discoveries of gold, silver and copper are almost daily made in different sections of the Territory, while it is well known that the Indians have their homes in the finest natural valleys and best timbered regions within the boundary. The Vulture mine at Wickenberg is turning out very rich quartz, and the mill is running night and day. It is the intention of some parties of this place, who own an extension of Mr. Wickenberg's claim, to put up a ten-stamp mill the coming winter. Nothing is being done with the mines in the lower portion of the Territory, and in the neighborhood of Prescott the treatment of the sulphurets is an up-hill job. A tri-weekly mail runs the entire length of the State—both of the Gila, and it is rumored that the service will soon be re-established between Prescott and Albuquerque .....The editor of the *Miner*, who has been on a visit to the place, describes the works of the Vulture Mining company, situated about one mile north of Wickenburg, on the banks of the Hassayampa. The mill has a battery of twenty stamps, four of Heady's concentrators, a crusher and various other contrivances, all run by an engine capable of running twenty stamps more, with the necessary appendages. From thirty to thirty-six tons of ore are crushed and worked every twenty-four hours, which pay on an average about $37 to the ton. The concentrators save about four tons of sulphurets every twenty-four hours, which, as soon as the proprietors find out some sure process by which to treat them, will be worked. By assay, the sulphurets pay over $200 per ton. The mill-site is one of the best in the Territory. Water is carried in pipes to every workshop and house upon the place, and neither time or space is wasted. This mill commenced running March 12th, 1867, and from that time up to October 16th, 1867, crushed 3,006 tons. It has not been idle one day (except Sundays) during all that time. About fifty men are employed in attending the mill, etc. Twelve teams are constantly engaged in hauling ore from the mine to the mill, at $10 per ton. Then follows a description of the mine, which is situated some fifteen miles southwest from the mill. There are about fifty men, Americans and Mexicans, working at the mine, which the editor believes to be the largest and best upon the continent. About forty tons of rock per day are taken out. Free gold may be seen in almost every piece, and rich specimens are frequently found.

California.

Nevada County.—We are informed, says the Nevada *Gazette*, that the last crushing of quartz from the Illinois and Wisconsin mine, of 199 loads, yielded at the rate of $54 a load. The yield of sulphurets of this lot amounted to twelve and a half tons—being over six per cent. These sell at the mill for $115 a ton. Since August, 1866, the mine has yielded $44,000 from 988 loads of quartz—a load averaging about a ton and a quarter. This is the amount yielded in free-gold at the mill, besides that realized from the sale of sulphurets. The quartz has all been crushed at the Sebastopol mill. The mine is opened to the depth of 300 feet, and the yield of the quartz has improved with the depth. .....The Nevada City *Transcript* says: Yesterday a wagon passed through this place having on a boiler weighing 2,575 lbs., designed for the Grizzly mine, which is located at Devil's Canon, near the Magenta flume. A short time since the five-stamp mill was increased to ten, but the mine has proved so valuable, and the rock can be obtained so rapidly, that more stamps have been found necessary. Twenty more stamps are to be added to the battery, and the boiler is designed for the mill. A gentleman who visited the mine lately informs us that it looks splendid, and will supply abundance of rock for thirty stamps. This mine belongs to a Connecticut company, and is under the superintendence of Mr. Clark.

Plumas County.—The San Francisco *Alta* has the following: The Crescent mill property, in Plumas county, was sold by the sheriff on Wednesday last for $15,000. We presume this was the famous Indian Valley quartz mine, which, from November, 1862, to the 9th of June last, yielded $667,215, of which $100,000 were paid in dividends, and $150,000 spent in improvements, current expenses having absorbed the rest. The total yield of rock was about 40,000 tons, and the average production per ton $16 18. The mill has thirty-two stamps. There were two mills at one time; but the second mill of twenty-four stamps was sold in 1866, and moved to the Whitney mine. The Crescent property includes claims on three veins, two of which, the Crescent and Horseshoe, run east and west, twelve feet apart, and the third, called the Pet, runs northeast and southwest, and cuts through both the others. The parallel veins are about five feet wide each, and the Pet is about half as wide, but the ore is richer than in the others.

Napa County.—The *Register* of the 9th ult. speaks encouragingly of the quicksilver mines which are being opened in Pope's Valley.

Amador County.—We clip the following items from the Amador *Ledger* of Nov. 9th: The result of the chloronation process for working sulphurets has established the fact that a very large amount of gold—hundreds of thousands of dollars—has been lost in this county alone. At the Coney & Bigelow works, under the superintendence of Mr. John Agrell, the result has more than met the expectations of the proprietors. Last Monday they melted down the last twenty-eight days' run, and were rewarded by receiving a brick of gold worth $1,540. This gold is 996 fine, and worth $20 58 per ounce.....Last Sunday the Oneida company made another good clean-up—the result being $12,000 after it was melted down.

Calaveras County.—A correspondent of the Calaveras *Chronicle*, under date of Nov. 5th, says: Sletcher & Lightfoot cleaned up fourteen tons from the Last Chance claim, which paid $120 per ton. The Casner & Barnes' last run of fifty-five tons paid $41 per ton. Peters, Champion & Co., on Enterprise Flat, have got the old Gouldsen mine in working order, and have out forty tons of rock that will pay from $50 to $80 per ton.

San Bernardino County.—A correspondent of the *Bulletin* writes from the town of San Bernardino: In various places, from thirty to forty miles from here, in the San Bernardino range of mountains, are gold, silver and copper quartz lodes, while nearly all of the elevations bordering upon Lytle creek and other streams contain large quantities of gold. To a small extent placer mining has been carried on by little squads of men, and placers of gold, varying in value from $50 to $300, have been occasionally found. There are at present parties at work in the hills upon the Mohave river, and also in the Holcombe Valley, forty miles from here, who take out from $5 to $10 a day per man. I have seen some very rich specimens of gold and copper quartz from Holcombe Valley, at which place there are several mines and two mills—the latter having been worked until quarrels and litigation swamped them. It is almost beyond a doubt but that vast quantities of gold will be taken from Lytle creek, situated about equi-distant from Cocomongo and San Bernardino, in the course of a few days. Gold has been found wherever prospected for in the vicinity, and at present a number of miners are to be seen at different places along the stream. To carry on mining operations here upon a grand scale it was declared necessary that the water from Lytle creek should be diverted from its original course, and flumes, dams, &c., constructed, for the purpose of ground-sluicing or hydraulic mining. Such a system of operations having been deemed possible, a short time ago Captain Winter and some other gentlemen took the matter in hand, and are so far advanced as to be able to go to work washing next week.

Montana

The *Post* of the 23d ult., has the following items: Although unable to obtain any definite information in reference to the yield of the St. Louis & Montana Co's. mill, yet we saw in the National Bank on Tuesday last, a brick of silver which ought to be evidence sufficient to demonstrate to a certainty the heretofore reputed wealth of this section. The ore was taken from the Poorman, and other leads, was crushed in a common arastra, without quicksilver, and it yielded at the rate of $75 per ton. We think there are few gold leads which would pan out in that way under the same circumstances.....The new ten stamp mill of the Lost Lake company, situated in New York Gulch, started up one day last week. It is under the superintendence of Mr Lamb, formerly one of the assistant superintendents of the Gould & Curry mill, of Virginia, Nevada, and bids fair to be a complete success. The mill crushes at the rate of fifteen tons of rock per day of twenty-four hours. It is now crushing ore from the Little Giant lode, and on Saturday last, after a run of two days, the plates looked remarkably well, and bid fair to make a good return for the first run .....Turnley's mill cleaned up last week $1,900 from seventy-five tons of ore out of the Park lode, Grizzly gulch. The returns which have recently been made from this lode, represent it as one of the richest lodes in that section.

Dakota.

A correspondent of the San Bernardino *Guardian*, writing from Utah, Oct. 18, says: There is sure to be a great stampede for these mines in the spring, as the quartz mania is raging fearfully throughout the country. I have no reason to doubt but there are some good lodes in that locality, though I do not believe them to be extensive. The Miners' Delight and the Corcso lodes are rich beyond a doubt. The latter was discovered by Martin Keplinger, resident of Spring ville. He brought a flour sack full of rock home, pounded up in a mortar and got $249. I am credibly informed that they have taken out several thousand dollars by the same process. There are a great many lodes located, though none of them exhibit such flattering prospects as the Coreso and Miners' Delight. They have also discovered one gulch which prospects well for placer mining, but there is no water to work it. A company is at work bringing in a creek for the purpose of working this gulch.

Oregon.

The Dallas *Mountaineer*, Oct. 26, says: From Susanville, Grant county, we learn the following: The John Day quartz mining company will be ready to commence crushing quartz next week, and then we will be able to tell what our quartz is going to amount to. If it proves rich it will be a good thing for that camp, as there are ledges too numerous to mention. Some of them prospect well with a hand mortar, but nothing short of a mill will test it well. The mill will be sufficient to give the quartz a fair test, as far as free gold is concerned.....Messrs. Cresap, Sawyer & Marshall are getting out quartz from the Marshall ledge, for the mill to work as soon as it gets to running, which prospects very well. That is the only ledge being worked at present. There is some rock at the National ledge ready for the mill, which is said to be very rich, but the company have suspended work for the present.

New Mexico.

From the Santa Fe *Gazette* we learn that extensive preparations are being made for working the Moreno mines next season. A company with $100,000 capital has been organized for the construction of a ditch from the Little Red river to the mines. This is a flush mountain stream and will afford a large supply of water. It is proposed to have the ditch complete and ready for use by July next. It will be constructed under the direction of Captain Davis.

Southern California and Mexico.

A correspondent of the San Francisco *Bulletin* writes from San Luis Rey, San Diago county, California, Oct. 27: There are a variety of mineral deposits in this county, and several mines have been more or less developed. The best mine in the county, probably, is the Encinitos copper lode, located about twenty-five miles above the town of San Diego, and a little more than four miles from the coast, where, I understand, a safe landing may be made for sailing vessels during certain seasons of the year. Assays from 10 to 19 per cent. of copper, with a little gold and silver have been made. This mine is owned by a company who are at present sinking a shaft; the prospects are very flattering, and it is confidently believed that rich pay ore will soon be found. The vein is about eight feet wide, and has been traced a distance of two miles. Considerable work has also been done on the Escondido gold mine, located between this place and San Diego, say about 31 miles northeast of the latter point. This mine has been worked at intervals for the last nine years, and although quite a large amount of pay ore has been extracted from it, it has, owing to gross mismanagement, failed to pay as it might have done under other circumstances. It is situated on a Mexican grant, and the owner requires a heavy tax on every ounce of precious metal exported, without any consideration of the time and money spent in such development. According to his books nearly $70,000 has been taken out of it. At present very little work is being done on the premises. There are some very extensive lodes in lower California, owned by parties in this county. One of the best is a copper mine, known as the Jesus Maria, located about 75 miles below San Diego, and said to be a large and extensive vein. It is not worked, however, for want of capital, and from being in a foreign territory. There are several other veins in the same neighborhood that prospect well. There is also a silver mine, called the San Pedro, about 140 miles below San Diego, that assays $67 in gold and silver. It is situated near wood and water, and is an extensive vein with an abundance of ore, so far as prospected. A shaft has been sunk nearly 100 feet, and work in a small way is still going on. There is a black lead mine about 25 miles southeast of San Diego, situated immediately on the Mexican line. The ledge is about 40 feet wide, but whether valuable or not has not been determined. It is to be fully prospected this fall. I saw a beautiful specimen of copper ore yesterday, taken from the Arizona copper mine, which I understand is principally owned by Gen. Allen of San Francisco. This is said to be the richest copper mine in the world.

Honduras.

A correspondent writes from Omoa relative to the future prospects of the American colony, hailing from the State of Georgia and recently established in the valley of Sula, adjoining the town of San Pedro, in flattering terms. He says: There is no doubt but that in after years this valley will compete favorably with the Southern States. There is an addition of a hundred families expected every day. Those who are now coming are men of means, who will bring with them saw mills, cotton-gins, and, in fact, all the machinery required for other purposes. The capitalists of the colony intend establishing a line of steamers direct from Mobile to Puerto Cabello. The republic donated to the colony a very large tract of land, and has given them the free navigation of the river Chimmelicon for ten years. This river runs along the whole tract donated by the government. They have also got patent rights for various American inventions: in fact the government has given them everything they have asked—even more. Among those who are hourly expected are a few men of means who are going to invest in silver mining. Your correspondent knows miners and mines that will pay from $100 to $2,000 per ton, that have been lying idle since this country gained its glorious and lazy independence, now forty-six years ago.

TIN.

Missouri.

The following is the report of Colonel Merrill, U. S. A., on the Missouri tin ores, referred to in our number of the 23d ult.:

ST. LOUIS, *Nov.* 11, 1867.

LIEUT.-GENERAL SHERMAN, U. S. A., St. Louis, Mo.—General: I have the honor to submit the following report of my recent visit to the tin mines owned by Mr. Zane, in Madison county, Mo. The mine is in sec. 15, township 33, range 5, east of the principal meridian. I left St. Louis on the 28th of October, reached Ironton the same night, started for the mine on the next morning, spent five hours and a half there, returned to Ironton that night, and arrived here at 12:30 P.M. on the 30th of October. I collected and brought up in my saddle-bags about forty pounds of ore, and have just concluded the assay of it, the results of which are as follows:

PROCESS ADOPTED.—The process followed in assaying was as follows: The ore was first thoroughly pulverized, and then weighed; it was then carefully washed, dried and re-weighed; it was then roasted for three hours in an iron pot, kept at a red heat, without cover, having been first thoroughly mixed with five per cent. of carbonate of soda, and five per cent. of charcoal, the per centage being taken on the original weight of the ore. It was then re-washed and dried, after steeping about an hour in the pot of water, into which it was poured from the roasting-pot while hot. It was then prepared for smelting by being thoroughly mixed with twenty per cent. of the carbonate of soda, and ten per cent. of borax, both having been first thoroughly pulverized. These per centages were taken on the last weight of the reduced ore. Ten per cent. more of borax was kept in reserve, to be added just before removing the crucibles from the furnace, but in none of these three cases was it found necessary to add this reserve of borax, as the contents of the crucibles were found to be sufficiently liquid without it. In putting the ore in the crucible they were first sprinkled with pulverized charcoal, and a thin layer of it was left on the bottom; the mixed ore was then placed in, and on top was another layer of charcoal; the crucibles were then placed in a brass-founder's furnace, and kept at white heat for about an hour, and the contents then emptied into a sow, the metal being gathered after cooling. The process given above, known as the dry process, was adopted as most like to the process that would necessarily be used in actual mining operations, and therefore giving better practical results than the wet or acid process, though probably a little wasteful of metal. The crucibles used were black lead.

1st ASSAY.—Several specimens of what the miners called "decomposed granite;" the principal ingredients besides the metals were felspar, quartz and mica, with a trace of arsenic, and probably manganese. This material, in a more or less compact condition, is found everywhere on the property, and in the greatest abundance, and therefore the determination of its per centage was particularly important.

Original weight of ore taken from mine	9 lbs.	5 oz.
Weight after washing	6 "	
Added for { Carbonate of soda		7½ "
roasting. { Charcoal		7½ "

[After roasting and washing it was decided to repulverize, as these specimens had been passed through a courser sieve than No. 3, and were not considered fine enough.]

Weight after repulverizing and washing	2 lbs.	12½ oz.
For { Carbonate of soda		9 "
smelting. { Borax		4½ "
Residuum of metal		4 "
Residuum of tin, after refining		2.317712 oz.
Per centage of tin to original weight of metal		1.5555

2d ASSAY.—Miscellaneous specimens, most of them quite hard, taken mainly from lateral vein in excavation at Mountain lode.

Original weight of ore as collected from mine	11 lbs.	9½ oz.
Weight after washing	7 "	15 "
Added for { Carbonate of soda		9½ "
roasting. { Charcoal		9½ "

[Repulverized as in first assay.]

Weight after repulverizing and washing	4 lbs.	60 oz.
For { Carbonate of soda		12½ "
smelting. { Borax		7 "
Residuum of metal		5½ "
Residuum of tin, after refining		4.480857 oz.
Per centage of tin to original weight of ore		2.4188

3d Assay.—A number of specimens of dark, greenish, semi-decomposed ore from the main vein in Mountain lode.

Original weight of ore	6 lbs.	13 oz.
Weight after pulverizing and washing	2 "	4 "
Added for { Carbonate of soda		5½ "
roasting. { Charcoal		5½ "
Weight after washing	2 "	7½ "
For { Carbonate of soda		7 "
smelting. { Borax		4 "
Residuum of metal		5½ "
Residuum of tin, after refining		2.681712 oz.
Per centage of tin to original weight of ore		2.6254

These assays were conducted by Dr. Goulding, but I assisted and was present at and noted each step taken. They were fairly and openly conducted, and, being almost exactly the same that would be made in actual mining, I think they represent fairly the present yield of the lodes as opened. The veins will doubtless prove richer as the excavations progress. I append a partial copy of the Land Office map of township 33, range 5, east, on which the property which Mr. Zane claims to own is outlined in red, and that which he claims to have bonded in green; also a map of section 15, and part of section 14, showing Mr. Zane's property, and the position and strike of veins so far as opened. The bearings were taken with a prismatic compass, but the distances were estimated. Also a sketch of the condition of the excavation at the Mountain lode on the 29th of October. The hill in which this lode is situated is entirely disconnected with the main system of hills, rising from the valley like an island.

Respectfully, your obedient servant,

(Signed,) WM. E. MERRILL,
Maj. Engrs. and Bv't. Col.

COAL AND IRON.

Indiana.

The Indianapolis *Herald* says: But few of the people of Indiana have any idea of the rich mineral deposits of Clay, Vigo and Putnam counties, adjoining the line of the Terre Haute and Indianapolis railroad, and especially the first named. In some respects those deposits have no equal. Iron manufacturers will understand the value of Brazil coal when we state that it approximates very near to charcoal, if it does not quite, for melting purposes. For that use it is the best mineral coal in the world, and perhaps there is no other like it—at least none has yet been discovered. In appearance and gravity it resembles charcoal, even to the wood fibre of the latter. So valuable is it that one furnace in St. Louis is using five car loads a day, and it is probable that in a short time the demand for it in that city and in Chicago will be equal to the capacity of the railroad to furnish. There is also an abundance of native iron ore in the neighborhood of Brazil, and of a superior quality. When this ore is mixed with Missouri Iron Mountain or Lake Superior, which can be transported cheaper to the mills along the Terre Haute railroad than it can be to the iron regions of Ohio and Pennsylvania, iron of a better quality, and several dollars cheaper per ton, can be made than in those States. An experienced iron man from Cleveland informed us the other day that in two years the country from Greencastle to Terre Haute will be equal in iron works to the Mahoning Valley in Ohio, with far greater advantages for making iron. A number of iron men from Ohio and Pennsylvania have lately made heavy investments in the neighborhood of Brazil. An Ohio company has bought and leased 50,000 acres of coal lands, and are now erecting a large furnace and rolling mill at Harmony, three miles east of Brazil. The investments this year will amount to $200,000: they intend to erect a mill for rolling railroad iron next year. This is only one point. At Terre Haute there is a fine merchant iron mill being erected, another at Greencastle, and one in this city, and all will be ready for operation during the coming fall. At Brazil a large furnace, costing some $60,000, owned by an Indianapolis company, is nearly completed. Its capacity will be twenty-five tons per day. This company intend to erect another stack, as the machinery is ample for two. Just east of Harmony another furnace is being erected by the Indianapolis Rolling Mill company. These improvements going on this year will give some idea of the rapid development of the iron interest between and including Terre Haute and Indianapolis, and this is but the beginning.

China.

It is reported that a large bed of the best quality of bituminous coal has been discovered between Chinkiang and Nankin, three miles from the Yang-tse-Kiang River. The English Consul, Mr. Workham, will endeavor to pursuade the Chinese officials to allow foreigners to work the mine.

MARKET REVIEW.

Gold and Silver Stocks continue dull and inactive. La Crosse sells at 34; Colydon at 40; N. Y. Gold at 81; Smith & Parmelee at 3.15; N. Y. and Eldorado 1.40 and 1.55, b3; consol'd Gregory at 5.25; N. Y. Gold 2

	Bid.	Asked.		Bid.	Asked.
Alameda Silver	— 40	70	La Crosse Gold	— 33	35
American Flag	— 58	60	Liberty Gold	— —	3
Atlantic and Pacific	— —	1 00	Manhattan	125 00	—
Bates & Baxter Gold	— —	75	Midas Silver	— 55	— 90
Benton Gold	— 35	45	Montana Gold	— 14	18
Bobtail Gold	— —	3 00	New York	— 80	82
Black Hawk G	6 25	10 00	New York & Eld'o	— —	1 55
Bullion Consolidated	— 40	1 00	Nye Gold	— —	4
Columbian G. & S.	— 3	8	Owyhee Mining	— —	10 00
Combination Silver	45 00	60 00	People's G. & S. of Cal	— —	40
Consolidated Gregory	3 50	5 50	Quartz Hill	1 15	1 20
Corydon Gold	30	45	Reynolds Gold	— —	5
Edgehill Mining	2 40	2 53	Rocky Mountain Gold	— 20	25
Gold Hill	— —	4 00	Seaver Gold	— —	— —
Gunnell Gold	1 05	1 20	Smith & Parmelee Gold	3 10	3 15
Gunnell Union	— —	20	Sensenderfer	6 00	8 00
Hale G. & S.	— —	91	Symonds Fork Gold	— —	1 00
Harmon G. & S.	— —	6 00	Texas Gold	— —	12
Holman	— —	12	Twin Riv. Sil	85 00	90 00
Hope Gold	— —	25	Vanderburg G	— —	75
Kop & Buell Gold	— 5	40	Yellow Jacket	— —	— 5

Copper Stocks are likewise dull and are quoted:

	Bid.	Asked.		Bid.	Asked.
Caledonia		10 00	Hilton		1 00
Canada		50	Indiana	50	90
Copper Falls	24 00	— —	Isle Royale		6 00
Charter Oak		3 00	Knowlton		1 75
Evergreen Bluff		2 00	Ogima		3 00
Gardiner Hill		2 00	Rockland	— —	6 00

Petroleum Stocks are more active. Sales of Buchanan Farm are made at 8; Pennebroit Run at $2 60, and Pit Hole Creek 90c. The quotations are:

	Bid.	Ask'd.		Bid.	Ask'd.
Beaubien Run	2 00	2 05	N. Y. and Allegheny		3 00
Brevoort		60	Pit Hole Creek	90	95
Buchanan Farm	7	9	Rynd Farm	7	9
Bivens		25	Second National		
Central	90	1 00	United Pet. Farms		12
Clinton Oil		1 50	United States	1 75	2 00
Manhattan		10	Union	1 75	
National		3 00	Webster		

Miscellaneous Stocks—Walker Lead sells at 52c.; Delaware & Hudson Canal is quoted at 144; American coal, 48; Quicksilver Mining, 19@19½; Pacific Mail S. S. Co., 125@125½; Mariposa Pref., 15½; Delaware, Lac. & W. 115; New York Central at 117⅞; Erie at 72⅝; Michigan Southern at 82; Northwestern at 58¾; Northwestern preferred at 67; Rock Island at 96⅞; Western Union Telegraph at 33½; Adams Express, 78¾@78½; American Express 76 77; United States, 75@75½; Wells, Fargo & Co., 54@55; Merchants' Union, 50 per cent., 58@58½.

Government Stocks—The market for Governments is very heavy and weak. The continued decline in gold without a corresponding advance in Five-twenties abroad has reduced the relative value of bonds on this market. This movement produces an excess of sellers over buyers among investors, and the market has thus become heavily loaded with bonds. The following are the quotations:

U. S. 6s, 1881, regular	107½@108
U. S. 6s, 1881, coupon	111⅝@111⅞
U. S. 6s, 5-20s, 1862, regular	104½@104⅝
U. S. 6s, 5-20s, 1862, coupon	107½@107¾
U. S. 6s, 5-20s, 1864, coupon	104½@104⅝
U. S. 6s, 5-20s, 1865, coupon	105⅛@105¼
U. S. 6s, 5-20s, c. July, 1865	107⅛@107¾
U. S. 6s, 5-20s July, 1867, coupon	107½@107¾
U. S. 10-40s, regular	100⅛@100¾
U. S. 10-40s, coupon	100⅞@101
U. S. 7-30s, June, small	104⅞@105
U. S. 7-30s, July, small	104⅞@105

Foreign Exchange is dull. There is very little demand from importers but the supply of commercial bills also is very limited, so that rates show no material change. Leading drawers quote sterling, 60 days, 109¾@110; it is not easy to sell at better than 109¾. We quote:

London, (prime bankers') 60 days	109¾@110
London, (prime bankers') sight	110¾@110½
London, prime commercial	— @ —
Paris, (bankers') long	5.16¾@ 5.15¾
Paris (bankers') short	5.13¾@ 5.13¾
Antwerp	— @ —
Swiss	— @ —
Hamburg (bankers')	36 @36¼
Amsterdam (bankers')	41¼@41¾
Frankfort (bankers')	41 @41¾
Bremen (bankers')	79 @79¼
Berlin (bankers')	71¾@72

Gold—The downward tendency in gold is checked this Friday morning by the high rate of exchange, and the uncertainty as to what may be the shipment of specie to morrow, and reports of the return of bonds from Europe. These influences have kept the price at 143⅛@143¾. Discounts are active and firm, at 7@9 per cent. for prime names. Money continues to show a steady gain to ease. On call loans the rate is generally 7 per cent., but the exceptions at 6 per cent. are becoming more important. The steamship Golden City, which sailed from San Francisco for Panama on the 30th ult., took $1,183,000 in treasure, of which $1,181,000 was for New York.

Copper has been quiet with sales on Tuesday of 100,000 lbs. Detroit at 22¾, and 100,000 lbs, 22½, four months. Portage Lake and Baltimore have been sold in small lots at 21½, 21¾@22. The decline in gold interferes with business. The London Market was rather firm for Chili, at £59

Tin—Straits is firm with sales of 250 slabs, Malacca, at 24 cents, gold; English is quoted 23@23½ cents, gold, and Banca 26.

Spelter is quoted at 6¼, gold, for Silesian.

Lead, steady, at 6½c., gold, for ordinary foreign.

Pig-iron—Unsettled by the decline in gold. Sales of Scotch at 37½c. for Glengarnock, No. 1; American is quoted, nominal, $40 for No. 1.

Petroleum is quiet but steady. Crude at 10½c. in bulk, and 16½@20½c. in bbls. Refined in bond at 25c. for standard white. Tree oil is steady.

THE SLATE TRADE.

[FROM OUR SPECIAL CORRESPONDENT.]

BUFFALO Dec. 7, 1867.

The slate trade, West, is about over, and as your correspondent anticipated, the result has disappointed the expectations of dealers—the flattering prospects of a large trade which the inquiries during the spring promised, have, by no means, been realized, and we have here, on hand, several thousand squares to winter, and sell in the spring at a reduced figure, besides sustaining a loss from breakage, handling, interest, etc. The sole cause of this is the extravagant prices charged at the quarries, which practically placed slate beyond the reach of any but the wealthier class of builders. There are hundreds of people who desired a slate roof on the houses they were building, but who used other cheaper material, because slate was too expensive. There is no doubt but that slate roof, even at the price, would be the cheapest in the end. Nevertheless, this fact was not considered when the price per square was mentioned. The quarrymen, in acceding to the exorbitant demands of their workmen, are to blame for this state of affairs, and justly, they are the principal sufferers, as at this time there are between 40,000 and 45,000 squares of slate lying on the quay banks in Vermont, and probably as much more, if not a greater quantity in Pennsylvania, and these slate will have to be wintered, sustaining the necessary losses before mentioned, and sold in the spring at a reduced price, for it will be impossible to obtain the present price when the spring trade opens, with the large stock which will be on hand. The policy pursued by quarrymen is simply suicidal. The slate trade would increase fifty per cent., yearly, if the interests of their customers were better protected by them, and they would sell all they could possibly manufacture; their workmen could be profitably employed the entire year, whereas, now, as soon as the demand is active, the price is increased, and winter finds the trade dead, large stocks or unsold slate on hand, and the workmen idle. Let the price be made in the spring and continued during the year. Let the workmen understand that strikes for higher wages will not be acceded to. Let the quarrymen unanimously agree to pay fair wages, and no more, under any circumstances, and, if possible, (?) stick to such an agreement. The result cannot fail to be satisfactory to all around, and Quarrymen, workmen, dealers, and slate-roofers, at the end of the year will mutually congratulate each other as they compare profits, and an appreciative public will encourage and patronize, until the slate trade will justly rank among the most important and extensive interests in the American market. Dealers are selling at about cost, as follows:

Vermont, purple and green, on cars, here	$11 00
Delivered in Cleveland	12 00
do Cincinnati	13 00
do Chicago	14 00
do St. Louis	14 50
do Louisville	14 75

Inferior unfading, $1 per square less. Vermont red, $1 per square less.

THE IRON TRADE.

NEW YORK, Dec 13, 1867.

Domestic.—The general market continues dull. In pig iron, trade is very quiet, though not of a character likely to be permanent. The sales of the week have been few. Nothing was done in American, and in Scotch pig 400 tons will cover the total amount. We quote Scotch pig, iron vessel, at $36 00, and from yard, at $39 50. Apart from this we have no other change to note. In manufactured iron, the business of the week has undoubtedly been better. Prices are unchanged and stiffer.

Foreign.—The British iron market, like our own, is considerably depressed. Pigs, of lower qualities, are weaker, and sales have been fewer, though reports continue hopeful.

WEEKLY STATEMENT OF NEW YORK IRON IMPORTS.

The following table shows the quantity and value of iron imports at the New York Custom House, for the week ending and including Dec. 6, 1867:

	QUANTITY.	VALUE.
Chains and anchors	76	4.184
Iron, Hp., tons	1.6	3.871
Iron, Pig, tons	799	12.760
Iron, Sheet, tons	88	5,102
Iron, tubes	11	762
Iron, other, tons	1.328	44 598
Nails	50	1.404
Old metal	..	1.409
		$76 060

BOSTON IMPORTS OF PIG IRON FROM JAN. 1st TO DEC. 7, 1867.

	1867.	1866.
From Great Britain, tons	29,695	20 624
Coastwise ports	8.652	13,776

Lehigh Valley Iron Trade.

The following table shows the amount of Pig Iron transported over the Lehigh Valley Railroad for the week ending Dec. 7:

From	Tons.	Total from Oct 5, 1867.
Carbon Iron Co	270	2.375
Lehigh Valley Iron Co	100	1.428
Thomas Iron Co	745	7.795
Lehigh Crane Iron Co	545	9.545
Allentown Iron Co	500	5.260
Robert Iron Co	25	1.645
Glendon Iron Co	70	3.850
Other shippers	255	787
Total	2.490	28.170

Marquette, Michigan, Iron Trade.

The following are the receipts of ore and pig iron at Marquette up to, and including Saturday, November 30, 1867, by the Marquette & Ontonagon Railroad:

IRON ORE.

	Week	Total.
Pitts. & L. Ang. Fu Co.	....	51.967
Edwards' Mine	321	5,519
Cleveland Iron Co	55	36,917
Marquette Iron Co	....	5,894
Lake Sup. Iron Co	163	108,560
New England Iron Co	80	9,943
Washington Iron Co	598	24,726
Jackson Iron Co	....	139
Ore to local furnaces	2,105	38,220
Total iron ore	3,122	281,885

PIG IRON.

	Week.	Total.
Morgan Fu Co	170	5,849
Greenwood Iron Co	24	5.497
Bancroft Iron Co	127	3,053
Collins Iron Co	128	4.031
Michigan Iron Co	....	4.128
Iron Cliffs Co	....	57
Total, pig iron	459	23,215
Total Ore and Pig	3,581	305,100

Production of Anthracite Pig-Iron.

The following statement exhibits the annual production of Anthracite Pig-iron in the United States, from 1849 to 1866 inclusive. Estimate for the present year would indicate a production of about 750,000 tons:

Year.	Production. Tons.	Year	Production. Tons.
1849	218,664	1864	621,563
1854	540,355	1861	411,469
1855	382,868	1862	472,779
1856	444,012	1863	580,214
1857	391,350	1864	686,482
1858	363,670	1865	482,134
1859	473,985	1866	760,399

Manufacture of Rails in the United States.

During last year there were 181,099 tons of new, and 236,834 tons of re-rolled rails made in the United States, as follows:

	New Rails, Tons.	Re-rolled Rails, tons
Maine	....	3,512
Massachusetts	6,566	23,561
New York	10,538	54 857
New Jersey	2,500	516
Pennsylvania	151 348	57,428
Maryland	4,000	3,159
Western Virginia	....	989
	181,199	
Ohio	5,747	26,122
Kentucky	1.280	8,576
Indiana	....	10,428
Illinois	....	45,534
Michigan	....	11,186
Tennessee	....	11 046
		236,834

During the same period we imported about 100,000 tons, making the total consumption of rails in 1866, 517,933 tons of 2,000 lbs.

Product of the Michigan Mines for 1867.

The following figures show as near as may be, the product of the several mines for the year 1867. The two or three weeks yet to intervene before the closing of navigation, will add a few thousand tons to these figures. Of the ore sent to local furnaces, it is perhaps proper to add that the Superior furnished the greatest bulk, thus perhaps, leaving it several thousand ahead of all others in the amount of shipments. On the other hand, it is claimed that the Jackson report is given in gross tons, while the Superior shipped net tons only. If the latter proposition is true, then the Jackson ought most certainly be placed at the head of the list.

MINE.	TONS.
Jackson (including Gray's)	125,000
Lake Superior	115,000
Cleveland	90,000
Pittsburgh and Lake Angeline	52,000
New York	50,000
Washington	24,000
New England	10,000
Marquette	6,000
Edwards	5,000
Iron Mountain	2,000
Champion	500
Sent to Local Furnaces	33,000
Total	512,500

Iron Shipments from Liverpool to the United States

The following are the shipments of iron from the port of Liverpool for the fortnight, ending Nov. 23d, 1867.

CHAINS AND ANCHORS.—Boston, 12 tons chains; New York, 28 tons chains; New York, 23 tons chains; Boston, 27 tons chains; N. Orleans, 14 tons chains; New York, 30 tons chains.

IRON, BAR AND BOLT, tons.—Boston, 162; New Orleans, 22; New York, 400; Philadelphia, 14; Boston, 160; New York, 10; Portland, 30.

IRON, HOOP, tons.—New York, 100; Philadelphia, 14; Boston, 25; N. York, 5.

IRON, PIG, tons.—Baltimore, 76.

IRON CASTINGS, tons.—New York, 29.

IRON, RAILWAY, tons.—New York, 234.

IRON, ROD, tons.—Boston, 29; New York, 55; New York 37.

IRON, SHEET, tons.—Boston, 19; New York, 75; Boston, 114; New York, 99; San Francisco, 410.

IRON, WIRE, tons.—Boston, 4; New York, 19.

Market Prices.

NEW YORK, Dec. 13, 1867

DUTY.—Bars, 1 to 1½c. per lb.; railroad, 60c. per 100 lbs.; boiler and plate, 1½c. per lb.; sheet, band, hoop and scroll, 1¾ to 1¾c. per lb.; pig, $9 per ton; polished sheet, 2c. per lb. Payable in gold.

Anthracite, No. 1, best	$41 00	@	— —
" 2x, fdry	38 00		39 00
" Grey Forge	35 00		38 00
Scotch Pig, from vessel	36 00		39 50
Charcoal, coal blast	50 00		67 00
old Wrought sc'p, fm yd	45 00		47 00
" " fm. vsl.	40 00		— —
English rails, gold	52 50		57 00
American " at works	78 00		80 00
Nails and spikes	5 75		....
Old Railroad Iron	48 00	@	....
Hoops, ¾ per ton	$190 00		
" ¾ "	160 00		
" 1 "	150 00		
" 1¼ "	140 00		
" 1½ "	137 50		
" 1¾ to 2 per ton	137 50		
Scroll Iron—¾x14 per ton	180 00		
" 12 "	170 00		
" 10 "	160 00		
" 3-16 "	150 00		
" ¼ "	140 00		
" ¾x14 "	160 00		
" 12 "	160 00		
" 10 "	150 00		
" 3-16 "	140 00		
" ¼ "	135 00		
" ¾ "	132 50		
Swed'h Fu, ord'y sizes, ⅞ to 2 sq., per ton	155 00		
1½x¾ to ⅝ and ¾ in sq	160 00		
1¼x⅜ to ⅝	165 00		
6 to 12x¾ to 5-8	165 00		
Common Iron			
¾ to 2 in. round and sq	95 00		
1 to 6 in. wide by ⅜ to 1 th.	95 00		
1 to 6 in. wide x¼ to 5-16 th.	105 00		
½, 9-16, 5-8, 11 16, r'd & sq.	105 00		
2½ to 3 inches	105 00		
Refined Iron.			
¾ to 2 in. r'd and sq	105 00		
1 to 6 in. wide x ¾ to 1 th.	100 00		
2½ and 3½, round and sq	115 00		
Rods—5-8 and 11-16, round & sq., per ton	105 00		
½ and 9-16 round & square	110 00		
7-16, round and square	120 00		
⅜ " "	125 00		
5-16, " "	130 00		
¼ " "	135 00		
3-16, " "	165 00		
Horse Shoe Iron	127 50		
Band—1 to 6 in. x 5-16 to No. 10	132 50		
1 to 6 in. x No. 11 and 12	132 50		
Ovals and half Rounds.			
¾ to 1½	127 50		
⅝ & 11-16	132 50		
½ & 9-16	137 50		
Nail Rods, per lb.			
"			
"	9@9½		
Norway shapes	8¾c		
Spring steel	10½c		
Tire " ⅝ to ½x1½ & 5-16	10¾c		
Toe Cork Steel	10¾c		
Sleigh Shoe Steel	10½c		
Plow Steel—6 to 14x¼ to ⅜	11c		

[From Boston Shipping List.]

BOSTON, Dec. 11, 1867

Swedish—common ass'd	$150	@	155
English—com	90		95
do refined	100		105
do sheet, per lb	6½	@	10c
Russia, sheet	15	@	17c
Scotch Pig, No. 1			
Gartsherrie	$44	@	45
No. 1, other brands	41		42
American, No. 1	40		45

PITTSBURGH, Dec. 7, 1867.

Pig-Iron and Bloom Market.—The market during the week was very dull, with a limited demand for most descriptions. The sales in the aggregate only reached 1,268 tons, as follows: 410 tons anthracite, and 958 tons of bituminous coal smelted. The principal inquiry was for the better grades, which were held firmly—particularly standard forge irons. Interior was not much tackled. We are reported the following sales:

ANTHRACITE.

100 tons	Neutral Anthracite	$40 00—6 mos.
160 "	Forge	private terms.
30 "	Foundry	46 50—cash.
80 "	Gray Forge	private terms
20 "	o. 2 Foundry	44 00—4 mos.
10 "	No. 2 Foundry	45 60—4 mos.
30 "	No. 1 Foundry	46 00—4 mos.

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.

40 tons	Mahoning Valley Foundry	$46 00—4 mos.
179 "	Open Gray Forge at Furnace	38 50—4 mos.
30 "	Open Gray Forge at Furnace	41 00—4 mos.
118 "	Open Gray Forge from yard	40 00—4 mos.
190 "	Medium Gray Forge from yard	40 00—4 mos.
100 "	Close Gray from yard	38 00—4 mos.
100 "	Medium Close Gray, from yard	38 00—5 mos.
100 "	Molted from yard	39 00 —4 mos.
200 "	Interior White from yard	35 00—cash.

Iron Bars and Nails.—Since our last weekly report, there has been no material improvement in the trade, which is reported as very dull, and no prospects of a revival, unless a general rise takes place in our rivers, which will no doubt increase business to a considerable extent. By reference to our card rates, it will be seen that there has been a further reduction of ¼ per lb. on all kinds of iron. Manufacturers are gradually curtailing operations. Nails continue as they have been quoted for the past month

Steel.—In this department of trade business continues very dull.

LONDON, Nov. 16, 1867.

(From the London *Mining Journal.*)

Bars, Welsh in Lond.	£6 10	0	£6	To arrive	10	2 6	10 5 0
1 mo to arrive	6 10	0	....	Do. railway, Wales	£5	0 0	@£5 10 0
Nail rods	7 0	0	7 10 0	Do. merch. Type or			
" Stafford in Lond.	7 10	0	8 10 0	Tees	6	10 0	.. ....
Bars	7 10	0	9 10 0	Pig, No. 1, in Clyde	2	15 0	3 1 0
Hoop	8 10	0	9 12 6	Do. f.o.b. Tyne, Tees	2	2 6	.. ....
Sheets, single	9 5	0	10 0 0	Do. Nos 3, 4, f.o.b. do	2	6 6	2 7 0
Pig, No. 1, in Wales	3 15	0	4 5 0	Railway chairs	5	10 0	5 15 0
Refined metal, ditto	4 0	0	5 0 0	" spikes	11	0 0	12 0 0
Bars, common, ditto	5 15	0	6 0 0	Indian Charcoal Pigs			
Do. Swd. in London	10	2 6	10 5 0	in London	7	6 0	7 10 0

Iron Items.

It is stated in the *Revue Universelle*, that Morgan's method of increasing the production of blast furnaces six fold, is by giving them greater dimensions; as for instance, 9½ metres (= 31½ feet) in diameter, and blowing into the furnace with twelve tuyeres. A hollow cone is besides constructed in the middle part of the bottom of the furnace, by means of which a blast is also introduced into the furnace.

The Rensselaer Iron Works (Rolling Mills) stopped work Saturday night for the season. It has been the custom in years past, to stop for a short time for repairs at this time of the year; but now there is a probability that the mills will not run until next Spring. The prevailing dullness and absence of orders for work is the occasion of shutting down. By this stop some three hundred hands will for the present be thrown out of employment.—[Alb. Jour. Dec. 9.]

The Richardson process for puddling iron, is attracting much attention in England. It is stated that by that process, sulphur and phosphorus are nearly eliminated from the puddled iron. The time occupied for each heat is quite half an hour less than by the ordinary mode of procedure. Though the process seems to be covered by Bessemer's patents, and though the information available, on this subject, is only limited in extent, it may reasonably be assumed that considerable saving in time and fuel is effected.

The furnaces of Marquette county, Mich., are not behind the mines in the work accomplished by them. Of one we cannot avoid making particular mention, because it has made its first—and unprecedented—run during the present year. This is the Michigan. It went into blast Feb. 10th, and made four thousand tons pig iron before blowing out. The product of only one of the five furnaces at present shipping over the Marquette road, figures less than 4,000 tons. The Morgan heads the list with a product of nearly 6,000 tons, and is followed by the Greenwood which is only about 200 tons behind. Notwithstanding one new furnace has been adding its product to the years business, we are less the Northern which has not been doing anything. Next year there will be added to the list, the Champion, the Scoolcraft, and the Deer Creek furnaces.

The Cooper Furnaces at Phillipsburg, on the Delaware river, opposite Easton together with iron ore mines and other assets of the old Trenton Iron Company, have been purchased by Messrs. J. G. Fell, of Philadelphia, and A. Par

deo, of Hazleton, for $527,000. These gentlemen are at present and have been for a long time lessees of the Hazleton Coal Company's mines, and possess capital and resources to combine, in a profitable way, the production of coal at Hazleton with the manufacture of pig iron at Phillipsburg. The Cooper Furnaces are, we believe, three in number, two built in 1847 and one in 1862. Their joint capacity is about 30,000 tons pig iron per annum.

The Cambria Iron Company this week entered into contract with the Union Pacific Railroad Company for sixteen thousand tons of rails, sufficient to lay about 180 miles of track. The Cambria Company, under previous contracts, had furnished considerable quantities of rails to the Union Pacific Railroad Co., and the large new contract, just allotted, show that Cambria rails give satisfaction on the Western plains and at the foot-hills of the Rocky Mountains. The Cambria Iron Company own the largest rolling mills in the United States; and the favor in which Cambria rails are held among railroad men, is a safe assurance that the establishment deserves the reputation it enjoys throughout the country.

THE COAL TRADE.

NEW YORK, Dec. 13, 1867.

The wholesale trade of this week has been dull, though in the retail branch a little more inquiry and a better demand has been felt. The former is during this month principally engaged in disposing of its old stock in order to begin the new year with a clean record; while the latter makes the most of its short hour of briskness. There is no change of consequence in prices. Though the market is not suffering from any great dearth of coal, the sudden and unexpected closing of the canals by ice causes uneasiness among the wholesale dealers, and may increase the price of some qualities. It is stated that 21,000 tons of coal in transit are frozen up on the Delaware and Hudson, though the quantity locked up on the other routes is probably not so great.

The season of the Lehigh Valley Railroad closed on November 30, 1867, with the following exhibit:

1867	1,948,385 05
1866	1,730,474 13
Increase of 1867	217,910 12

Over what, before the merging, was the Beaver Meadow road, including coal put on the canal at Manch Chunk, the increase is 42,442 tons. This tonnage was derived from these sources:

	Tons. Cwt.
Mahanoy region	426,965 07
Wyoming region	279,154 11
Hazleton region	721,275 04
Upper Lehigh region	53,808 02
Beaver Meadow region	467,202 01
Total	1,948,385 05

The Cumberland Canal trade for the season has closed a few days in advance of the time fixed by the President for having the water drawn off, by an embargo laid upon it by the ice-king. The shipments of coal have exceeded those of any previous year. The clearances of boats from this port, for the year, were 4,224, carrying about 450,000 tons of coal. Last year 3,165 boats cleared, carrying about 343,000 tons of coal.

The following table shows the quantity of Coal shipped over the principal roads for the week ending December 7, 1867, compared with that shipped the same time last year:

	1866.		1867.		
	WEEK.	TOTAL.	WEEK.	TOTAL.	INCREASE.
Phil. & Reading R.R.	24,964	42,014	64,186	105,550	63,536
Schuylkill Canal	11,358	1,292,674	11,230	1,032,925	259,749
Lehigh Val. R. R	12,197	12,197	42,029	42,029	29,831
Lehigh Canal	169	1,066,702	9,029	1,006,603	59,631
Del & Hudson	22,625	1,502,894	32,631	1,401,120	98,209
Scranton North	6,383	408,141	10,263	477,214	69,026
Scranton South	24,219	1,023,951	22,299	1,165,310	141,373
Penn'a Coal Co. Rail	13,791	471,207	18,692	800,520	329,157
" " Canal	.....	24,909	.....	21,169	3,713
Wyoming North	.....	106,370	.....	82,376	23,940
Wyoming South	503	461,664	2,565	569,099	92,594
Shamokin	11,341	537,843	9,525	462,162	75,765
Trevorton	91	50,992	967	52,540	1,541
Short Mountain	2,169	108,538	2,564	83,771	24,754
L. V. Co	.....	26,262	2,039	77,332	57,070
Broad Top	3,963	235,629	5,140	228,952	26,979
Williamsto'n	.....	.....	.....	.....	.....
Total	143,796	7,201,587	231,960	7,463,918	.....
1867	.....	.....	.....	.....	.....
Decrease	.....	.....	.....	.....	.....

Schuylkill Coal Trade.

BY RAILROAD & CANAL, FOR WEEK ENDING DEC. 12, 1867.

	Railroad.	Canal.
St. Clair	32,806	.....
Port Carbon	8,560	.....
Pottsville	606	.....
Schuylkill Haven	14,186	.....
Auburn	2,029	.....
Port Clinton	3,380	.....
Total for week	63,180	11,230
Previously this year	42,104	1,021,695
Total	105,550	1,032,925

Lehigh Coal Trade.

SHIPPED FOR THE WEEK ENDING DECEMBER 7, 1867.

SHIPPERS.	CANAL. WEEK. TONS.	CANAL. TOTAL. TONS.	RAILROAD. WEEK TONS.	RAILROAD. TOTAL TONS.
FROM MAUCH CHUNK.				
Lehigh Coal & Navigation Co.	.....	.....	.....	.....
Summit Mines	3,625	501,350	.....	.....
Room Run Mines	.....	1,314	.....	.....
John Laubach & Co.	.....	352	.....	.....
Other Shippers	.....	.....	.....	.....
Total	3,625	503,020	.....	.....
FROM E. M. REGERS.				
John Connery	.....	.....	.....	.....
W. T. Carter & Co. (Coleraine)	555	15,559	939	.....
Spring Mountain Coal Co.	370	9,584	1 811	.....
Thomas Hull & Co. (N. Y. & Lehigh Co).	91	13,175	1,640	.....
Honey Brook Coal Co.	272	46,968	2,459	.....
German Pennsylvania Coal Co.	.....	11,764	733	.....
Beaver Meadow (D. W.)	.....	.....	.....	.....
Other Shippers	.....	.....	12	.....
Total	1,089	96,982	7,595	.....
FROM MAHANOY REGION.				
McNeal Coal and Iron Co	284	6,046	1,527	.....
Knickerbocker Anthr. Coal Co.	79	1,691	1,416	.....
North Mahany Mines (Mahanoy Col. now R. & C.)	.....	1,578	632	.....
Delano do	.....	1,140	.....	.....
Primrose Mines (Rathbun, Stearns & Co.)	.....	.....	350	.....
Walter, Brothers & Co. (now Bedford & Co.)	.....	82	.....	.....
Mount Etna Coal Co.	105	4,559	27	.....
Trenton Coal Co.	.....	184	.....	.....
Glendon Coal Co. (Glendon Colliery)	..	95	471	.....
Thomas Coal Co.	91	1,962	940	.....
Williams & Herring	.....	189	254	.....
E. S. Silliman	.....	.....	1,914	.....
East Boston	.....	.....	.....	.....
New Boston Coal Co.	.....	769	1,186	.....
Shamokin Coal Co.	.....	.....	.....	.....
Caledonia M. & M.	.....	.....	198	.....
Other Shippers	.....	.....	16	.....
Total	568	18,269	9,152	.....
FROM HAZLETON REGION.				
A. Pardee & Co. (Hazleton)	428	76,617	4,253	.....
G. B. Markle & Co. (Jeddo)	617	54,540	2,667	.....
Wm. S. Halsey & Co. (Mt. Pleasant)	.....	5,833	388	.....
Buck Mountain Coal Co.	278	44,298	2,281	.....
Sharpe, Weiss & Co. (Council Ridge)	.....	34,747	1,894	.....
Coxe, Brothers & Co. (Cross Creek)	.....	15,070	609	.....
Ebervale Coal Co	200	38,279	1,838	.....
Stout Coal Co.	(6)	21,750	854	.....
Harleigh Coal Co.	182	24,661	1,101	.....
Ashburton Coal Co.	.....	1,582	.....	.....
East Sugar Loaf	.....	.....	2,905	.....
Upper Lehigh C. Co.	199	16,252	1,661	.....
Highland	.....	17,686	974	.....
Mount Hall	.....	180	171	.....
Woodside	.....	2,518	258	.....
Latimer	.....	874	247	.....
Other Shippers	.....	.....	.....	.....
Total	1,909	348,949	21,180	.....

FROM WYOMING REGION.				
Newport Coal Co.	....	3,533	....	....
Warrior Run Mining Co.	....	2,148	....	....
Parish & Thomas	....	12,026	407	....
New Jersey Coal Co.	269	8,844	421	....
Lehigh & Susquehanna Coal Co.	....	2,933	....	....
Germania Coal Co.	95	9,051	34	....
Franklin Coal Co	....	5,507	....	....
Auburried Impr'v't & Coal Co.	188	9,504	....	....
Valley Coal Co.	....	189	....	....
Wilkes Barre Coal and Iron Co.	769	80,202	863	....
Baltimore Coal Co.	199	17,350	....	....
Union Coal Co	....	5,323	176	....
Wyoming Coal & Transp'n Co.	....	7,259	116	....
Everhart Coal Co	....	2,618	....	....
Morris & Essex Mutual	....	....	259	....
H. B. Hillman & Co	....	....	241	....
Bowkley, Price & Co.	....	....	....	....
T. F. Hunt & Co	....	....	....	....
G. B. Linderman	....	....	....	....
Harvey & Bro.	....	....	44	....
John Horton	....	473	....	....
Mineral Springs	....	....	404	....
Consumers	....	....	159	....
Plymouth Coal Co.	....	....	152	....
Enterprise Colliery, J. H. Sweyer	....	99	427	....
Washington Coal Co.	....	....	....	....
West Pittston	....	....	....	....
Shawnee	....	376	113	....
Other Shippers	251	12,295	....	....
Total	1,755	179,770	3,814	....
Grand Total	9,029	1,006,603	42,029	....
Total 1866	(6)	1,006,302	12,197	....
Decrease	....	59,699	....	....
Increase	8,869	.....	27,832	....

Cumberland Coal Trade.

For the week ending Dec. 7, 1867.
From the Alleganian.

COAL TRADE BY RAILROAD.—Statement of Coal shipments over the Baltimore and Ohio Railroad for the week ending Nov. 24, 1867:

From C. and P. R. R.	Tons.
Consolidation	1,226 07
American Company	2,072 07
Borden	728 06
New Hope	157 15
Midland	111 09
Hampshire	.....
From Eckart R. R.	Tons.
C. C. and I. C.	667 11
Spruce Hill	.....
Blaen Avon	.....
Total	5,260 15

From George's Creek via Piedmont.	Tons.
George's C. & I. Company	549 12
Central do	1,633 12
Atlantic do	467 17
Piedmont do	582 09
Swanton do	239 06
Barton do	1,036 01
Potomac do	1,592 18
George's C. M do	658 17
Franklin do	972 18
Hampshire do	1,109 01
American	1,857 05
Total	11,022 00

Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

At New York, December 13, 1867.

Schuylkill R. A., choice	$5 75@6 00	Lehigh Broken	5 25 ....
" Ordinary	5 25 5 50	" Egg	5 25 ....
" W. A., Lump	5 25 5 50	" Stove	5 50 ....
" Steamboat	.... 5 25	" Chestnut	4 20 ...
" Broken	....	Wilkesbarre Lump	5 25 ....
" Egg	....	" B'ken & Egg	5 25 ....
" Stove	5 50 5 75	" Stove	5 50 ....
" Chestnut	4 00 4 25	" Chestnut	4 75 ....
Lehigh White Ash Lump	5 37 ...		

SPECIAL COALS.—DEALERS' QUOTATIONS.

Diam'd Vein R. A., Sch'Kill	....	H. Heds, E. M'Klin, Lorb.	5 50 ....
Locust Dale W. A., "	....	New England Red Ash	5 25 ....
Honey Brook " Lehigh	5 50	Broad Mountain	5 25 ....
Harleigh " "	5 50	Wyoming	5 00 ....
Spring M'n " "	5 50	McNeal Co.	5 50 ....
Sugar Creek " "	5 50	Locust Mount'n (Reppher)	5 50 ....
Ashburton " "	5 50	Duncan Red Ash "	6 00 ....
Fulton White Ash	5 50	Wharrie Coal & Iron Co.	5 25 ....
Stout	5 50	New Burgh Orrell Gas Coal	9 00 ....
Old Co. "	5 50	Despard Gas Coal	9 00 ....
Buck Ridge W. A., Sh'kin	5 00		

Dealers in these Coals may be found in our advertising columns.

At Philadelphia, December 13, 1867.

Lehigh Lump and st'mb't	$5 00@....	Schuylkill Chestnut	2 75 ....
" Broken and Egg	5 00	Locust Mount. Lump and	
" Stove	5 00	Steamboat	4 25 ....
" Chestnut	3 75	" Broken	4 25 ....
Schuylkill R. A. Prepared	4 25 4 50	" Prepared	4 25 ....
" Chestnut	2 75	" Chestnut	2 87 ....
" W. A. Lump and		Lackawanna Coal	4 25 ....
Steamboat	4 25	Shamokin	4 75 ....
" Broken	4 25	Franklin, (Lykens Valley)	4 75 ....
" Egg and Stove	4 25	Broad Top	4 75 ....

Scranton Coal at Elizabethport, December 13, 1867.

(Corrected weekly by D. L. & W. R. R. Co.)

Lump	$4 25@....	Egg	5 00 ....
Steamer	4 50	Stove	5 50 ....
Grate	4 75	Chestnut	4 45 ....

Prices for Pittston Coal at Newburgh, December 6, 1867.

(Corrected weekly by Penna. Coal Co.)

Lump, per ton of 2240 lbs.	$4 70@....	Egg " " "	4 70 ....
Steamer, " " "	4 70	Stove " " "	4 99 ....
Grate " " "	4 70	Chestnut " " "	4 29 ....

70 cents additional to New York.

Lackawanna at Rondout, December 13, 1867.

(Average contract prices for year.)

Lump	$4 90@....	Stove	5 45@....
Steamer	5 00@....	Chestnut	4 50@....
Grate	5 20@....	Pea	4 25@....
Egg	5 30@....		

Lehigh Coal at Elizabethport, December 13, 1867.

Lump	5 50@....	Chestnut	4 50 ....
Steamboat and Brokers	5 25	Stove	5 50 ....
Egg	5 25		

At Baltimore, December 13, 1867.

Wilkesbarre & Pittston W. A., by cargo or car	$5 50@5 75	From wharf or yard, 75c. to $1 per ton additional.	
Lykens Valley R. A. by cargo or car	5 75@6 25	Retail, del'd, per 2,240 lbs	7 00@7 75
Sunbury & Shamokin R. of W. A. by cargo	5 50 5 75	George's C'k and Cumberland c. o. b. at Locust Pt for shipping	4 50@5 00

At Havre de Grace, Md.

Wilkesbarre or Pittston W. A., on board	$4 85@5 10	Sunbury or Shamokin, R. or W. A., on board	5 25
		Lykens Vly. R. A. on board	5 00@5 85

At Georgetown, D. C.

George's Creek and Cumberland on board ..... $4 25@4 50

Wilkesbarre Coal at Elizabethport, December 13, 1867

(Corrected by Wilkesbarre Coal & Iron Co.)

Lump	$4 50	Egg	5 00 ....
Steamer	4 50	Stove	5 25 ....
Broken	4 75	Chestnut	4 50 ....

Ten cents additional on Shipments from Jersey City.

Prices of Provincial Coals.

[CORRECTED WEEKLY BY LOUIS J. BALLOU, JR., 45 PINE STREET.]

Duty $1.25 per ton.

Black House (on board)	$2 00 gold	Little Glace Bay	1 87½ "
Gourie	1 75 "	International Co.'s	1 75 "
Logan	1 75 "	Slack Coal, S. H.	75 "
Sydney	2 25 "	L. L. L.	1 00 "
Pictou	2 25 "		

Prices of Foreign Coals.

Duty $1.25 per ton.

Corrected weekly by PARMELEE BROS., 32 Pine Street, N. Y.

Liverpool Gas Caking	$11 00	Liverpool House Cannel	—@20 00
" " Cannel	14 00	" " Orrel	16 00@18 00

Per ton 2240 lbs., Ex. ship.

PRICES FROM YARD

Liverpool Orrel, screened	$18@20	Liverpool Cannel, scr'd	22 00@— —

per ton 2000 lbs., delivered.

Coal Freights.

(Corrected Weekly.)

From Elizabethport.

Albany	$ 90@— —	New London	1 25@— —
Boston	1 90 2 00	Newport	1 40 — —
Bridgeport	1 00 — —	New York	55 60
Fall River	1 40 — —	Norwalk	1 00 — —
Hartford	1 50 — —	Norwich	1 30 — —
Hudson	1 00 — —	Pawtucket and towing	1 50 — —
Lynn	— — — —	Portland	1 60 — —
Middletown	1 25 — —	Portsmouth	2 15 — —
New Bedford	1 45 — —	Providence	1 50 — —
Newburyport	2 00 — —	Salem	1 80 — —
New Haven	1 00 — —	Taunton	1 40 — —

From Newburgh.

RIVER.	COAL BOATS.	EASTERN.	
Albany	50@....	Boston	1 75@....
Barrytown	25	Bridgeport	1 12½....
Catskill	35	Bristol	1 50 ....
Cold Spring	30	Dighton	1 50 ....
Coeymans	45	Fall River	1 45 ....
Coxsackie	40	Mystic	1 50 ....
Fishkill Landing	20	New Haven	1 12½....
Greenbush	50	New London	1 25 ....
Haverstraw	45	Newport	1 45 ....
Hudson	35	Norwalk	1 12½....
New York	70	Norwich	1 40 ....
Nyack	50	Pawtucket	1 45 ....
Peekskill	40	Providence	1 50 ....
Poughkeepsie	25	Stamford	1 12½....
Rhinebeck	30	Stonington	1 25 ....
Saugerties	35	Warren	1 45 ....
Sing Sing	50		
Stuyvesant	40		
Tarrytown	50		
Troy	55		
West Point	50		
West Troy	55		
Yonkers	55		

From Port Richmond, Philadelphia.

Boston	2 75 — —	New York	1 50 1 60
" light draft vessels	2 85 — —	New Haven	2 00 — —
" bridges	03 — —	New London	2 00 — —
Bath	2 75 — —	New Orleans	4 50 —
Braintree	2 90 — —	Norwich	1 95 — —
Charlestown	2 75 — —	Newport	2 10 — —
Chelsea	2 85 — —	New Bedford	2 00 — —
Cohasset Narrows	2 85 — —	Portland	2 75 — —
Dighton	2 10 — —	Pawtucket	2 20 — —
Fall River	2 00 — —	Providence	2 00 — —
Gloucester	2 90 — —	Portsmouth	3 02 — —
Hartford	2 55 — —	Roxbury	3 15 — —
Lynn	2 25 — —	Salem	2 10 — —
Mobile	4 00 — —	Sing Sing	1 45 — —
Norwalk	2 05 — —	Wareham	2 05 — —

From Rondout.

Boston	$2 00	New London	1 40
Bridgeport	1 25	Newport	1 60
Bristol	1 60	Norwalk	1 25
Dighton	1 55	Pawtucket	1 70
Fall River	1 60	Providence	1 60
Mystic	1 40	Salem	2 00
New Haven	1 25	Stamford	1 25
Norwich	1 50	Stonington	1 40

From Baltimore.

To Philadelphia	$1 40@— —	Boston	2 25@ 2 50
New York	2 10 — —	Sound Ports	2 25@ 2 50
Washington	1 10 — —	Norfolk	1 00@— —
Annapolis	75 — —	Richmond	1 50@— —

From Washington, N. J.

Hackettstown	$ 58	Iron Dale	$ 1 10
Waterloo	81	Dover	1 21
Sunbope	99	Paterson	1 80
Port Morris	99	Pompton	80
Rockaway	1 32	Bloomfield	1 80
Denville	1 33	Newark	2 00
Boonton	1 44	Belleville	2 10
Little Falls	1 70	Communipaw	2 10
Drakesville	1 08	Jersey City	2 20
Dickerson's Basin	1 11	New York	2 20

From Georgetown or Alexandria.

To Philadelphia	$1 50 — —	Boston	2 75 2 50
New York	2 15 — —	Sound Ports	2 25 2 50

Provincial Freights. Currency.

Sydney to N. Y.	$2 75
Sydney to Boston	2 75
Lingan	3 50
Lingan to Boston	3 00
Cow Bay	2 75
Cow Bay to Boston	2 75
Cow Bay to Portland	2 50
Big Glace Bay	2 87
Little "	2 50

Foreign Freights.

New Castle and Ports on Tyne	£17 load.
Liverpool	15s@17s. ton.

Rates of Transportation to Tide Water, June 1, 1867.

PHILADELPHIA & READING RAILROAD.

From Pottsville to Philadelphia	$2 17
" " Port Richmond	2 07
" " New York, drawback off	2 20

SCHUYLKILL NAVIGATION.

From Pottsville to Philadelphia	2 08
" " New York, drawback off	2 38

Wyoming Valley Canal.

	Tolls.	Freights.
From Wilkesbarre to Havre de Grace	97c.	$1 55
" " Columbia	69	1 20
" " Middletown	67	1 10
" " Harrisburg	61½	1 05

OTHER AVENUES.

From Mauch Chunk to Philadelphia, Canal, including unloading	1 88
" " Philadelphia, via North Penna Railroad	2 50
" " Elizabethport, via N. J. Central Railroad	2 05
" " Fort Johnson	2 10
" " New York	2 47
" " New York via Del. Div. and Raritan Canal, including unloading	2 67
" " New York via Morris Canal	2 39
" " Hoboken via Morris & Essex Railroad	2 10
" " New York	2 20

From Elizabethport to Buffalo, via New York Canal, a distance of about 450 miles—freight, $2 62, toll 78 cents 3 40

The shipping expenses at Elizabethport and Port Johnson vary from 25 to 50 cents.

SAN FRANCISCO STOCK MARKET.

SAN FRANCISCO, Dec. 1, 1867.

Crown Point, $80; Chollar, $13; Yellow Jacket, $5.00@525; Savage, $100; Kentuck, $100; Imperial, $17; Overman, $41.

BOSTON STOCK MARKET.

BOSTON, December 12, 1867.

Prices of mining stocks bid this day were as follows:

Copper Falls	21½	Huron	—
Albouez	—	Boston Water Power	17¾
Calumet	30	Isle Royal	—
Hecla	—	Minnesota	—
Canada	—	Quincy	—
Franklin	11	Cary Improvement	7¾
Hancock	—	Rockland	—

Sales at Boston Stock Exchange, December 12.

100 shares Water Power	17½	100 shares Hancock	12¾
100 do do	17 18	100 do do	12¾
150 do Cop. Fs	25	500 do do	12¾
50 do do	17 25	200 do do	12¾
200 do Rockland	7¾		

AMERICAN

Journal of Mining.

WESTERN & COMPANY, PROPRIETORS.

R. W. RAYMOND, EDITOR.

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☞ Correspondents, exchanges and others addressing us should be *extremely careful* to write "JOURNAL OF MINING," instead of "MINING JOURNAL," to ensure safe carriage. Communications intended for publication should be plainly written, and on one side of the paper only.

NEW YORK, SATURDAY, DECEMBER 14.

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NEW BUSINESS OFFICES.

For the convenience of patrons and the accommodation of a flattering and steadily increasing business, the proprietors of the JOURNAL OF MINING have opened commodious offices on the ground floor of No. 41 Pine street, between Nassau and William, the locality being central, and appropriate to the interests which the JOURNAL represents. All business relating to Advertisements, Subscriptions, Job Printing, Assaying, Wood Engraving, etc., will be transacted, and should be addressed there. The Editorial Rooms will be continued at 37 Park Row.

☞ Mining Companies should publish their annual statements, required by law, in the American JOURNAL OF MINING. For terms, apply at the office, No. 41 Pine street.

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COLORADO ORES.

Although it is now a tolerably well-known fact, that the "stamp-mills" are capable of extracting from pyritic ores only an average of about 25 to 30 per cent. of their contents in gold, while all the copper and the greater part of the silver are lost, the mill-process remains almost the only one in actual operation on the auriferous copper and tin pyrites of Colorado. The reasons of this adherence to a method so entirely inappropriate to these ores are various.

When this process of stamping with immediate amalgamation was introduced into Colorado, it was almost exclusively the surface quartz with which the miner had to do; and since this ore contained the gold in a perfectly free and amalgamable form, and generally, moreover, in considerable quantity, it was easy to beneficiate it by any mode of amalgamation. The great success which attended this treatment of the oxidized ores, and the confirmatory results obtained by the mill-men of California, naturally led to the belief that a direct amalgamation after wet stamping, was in every case, sufficient for the extraction of gold. But as soon as the shafts reached in depth the undecomposed sulphurets, the stamp-mills failed. A few very rich ores, containing still some free gold, continued, it is true, to yield more than the expense of treatment, but these exceptions strengthen the rule; and, even in such cases, it could hardly be said that mills were successful, which, with 40 to 80 stamps running, could only produce from rich ores a few hundred ounces per week. Since most of the companies and their agents, however, knew nothing of the character and proper treatment of their ores, they continued operations in the old way, until their exhausted means compelled them to cease. Others blamed their superintendents for the failures, and changed administrations, without altering results. When it finally became apparent that the sulphurets were not to be treated like the oxidized ores, a host of inventors, mostly without knowledge of the simplest chemical and metallurgical facts and principles, devoted themselves to the discovery of other methods, in which novelty was the only merit. Without inquiring whether in other lands, where mining and metallurgy, have been practised, the experience of centuries might not have overcome these difficulties, the mining companies adopted new processes, which had never been tested by experts, and only carried with them the assurance of their inventors, that they are a perfect success. Numerous methods of amalgamation appeared, the efficiency of which bore direct ratio to the knowledge, and an inverse ratio to the conceit, of their authors. They may be divided generally into two classes: those which, under favorable circumstances, and those which, under *no* circumstances, did as well as the old stamp-mills. Neither of these classes is worth the time and paper required for further description.

Another phase in the history of the discovery of new metallurgical apparatus was inaugurated, when the conviction was attained, that a desulphurization must precede the amalgamation of pyritic ores. CROSBY, and THOMPSON, DODGE, KEITH, HUBBELL, HAGAN, and a host of others enriched science with new methods of roasting (or old ones re-hashed); and these processes may be fairly, as a whole, included in the classification above given, of the patent amalgamators. At first, of course, they were all "perfect successes"; but time has forced the opposite opinion upon the public mind: and at present only a few of them still nourish a precarious existence upon meagre success. Mr. KEITH deserves the credit of having accomplished better results than any of the rest. His apparatus has extracted, from favorable ores, 75 per cent. of the fire assay; and we may say that when the ores are not refractory, he is able to average 50 per cent with economy. Many of the sulphurets, however, have baffled him entirely. At present, there is but one Keith mill running in Colorado.

In view of the unsatisfactory results of the new processes, and their high running cost, as compared with stamp-mills, the mine-owners can hardly be blamed for returning stolidly to the old method, the cheapness of which, at least, enabled them sometimes to pay expenses. This has been the course adopted by the Sensendorfer, Smith & Parmelee, Briggs, Black Hawk, and other companies.

A substantial success was achieved last year by Messrs. BRUCKNER, KRAUSS & REESE, who, after many thorough experiments, were able, measurably, to overcome the difficulties attending a perfect desulphurization of the auriferous ores, and a removal of the unknown cause which has been found to render the gold indifferent to quicksilver. (We say "the unknown cause," since we do not choose, in the present article, to enter upon the discussion of a question so difficult, nor to admit, on the other hand, the hypothesis of a "coating" of the gold, whether silicious or ferruginious, which is held by so many miners.) They have treated gold and silver bearing sulphurets of various character, and usually produced, by amalgamation after roasting, from 85 to 95 per cent. of the precious metal. The objections to this otherwise excellent, and for silver ores, scarcely to be improved process, are two. The first is the small scale on which it is conducted. The success to which we refer was obtained with an apparatus, the capacity of which was but one ton per diem; while the larger furnaces, since erected, and calculated for a capacity of five tons each, have disappointed expectation in this regard, and are said to be adequate only to a daily charge of one ton and a half. Of course, this fact is economically unfavorable; but it does not constitute a metallurgical failure. The other objection is, however, a metallurgical one, and inherent in the process itself. We refer to the loss of copper, and (in good ores) of silver. A small portion of the latter, alloyed in the ore with gold, is saved; and, indeed, all the silver can be extracted by a chloridizing roasting, which is the form of this process applied to silver ores proper: but scarcely any of the Colorado *gold* ores contain enough silver to justify the additional expense of such treatment. The value of the copper and silver together, in many of the Colorado sulphurets, (auriferous chalcopyrite, mixed with iron pyrites, containing 10 to 15 per cent. of copper,) reaches $60 to $100 per ton: and a process of gold extraction, however complete and careful it may be, which involves the loss of these elements, cannot be regarded as suitable for this class of ores, and should be confined to such material as contains little or no silver and copper. The further consideration of this question will occupy us next week, when we shall discuss the smelting process.

RICE VS. ROAST BEEF

In view of the possible attempt to establish an American production of tin, from the mines of Missouri, California or Idaho, we recur to the subject of the East Indian mines and the competition which they threaten. We are not desirous of frightening Americans from this enterprise: but we would show them soberly that it is a business in which only great economy and skill can give them an advantage. The Dutch East Indian monopoly has already half ruined the Cornwall tin mining interest: and, while we do not say it would be hopeless to attempt a conflict with that powerful establishment, we do say that no one should be over sanguine of the result, or enter upon it without counting the cost. The following extract, which we came across in a last year's number of the London *Mining Journal*, puts the matter in a strong light as between Banca and Cornwall. We need scarcely add that the contrast between the pauper labor of the Orient and the well-paid labor of this country is still greater. Says the *Journal's* correspondent:

"The question is, where is the tin coming from, and what is the reason the prices are so low? There is an island in the East called Banca; it was in the possession of the English in 1813, but it was ceded to the Dutch in 1817. Banca is a mountainous granite island, in some places rising 3,000 feet above the level of the sea, in awful grandeur; it is 140 miles long, and 35 miles broad, consequently nearly three times as large as the county of Cornwall. It is 106 degrees east longitude from Greenwich, and about 2 degrees north latitude; so we see, by its position, it is so hot that Europeans can scarcely exist, having two summers in twelve months. However, this is only known to the man of science and the philosopher. The tin is raised by Chinese miners, who emigrate there, the same as our miners to any other part of the globe. The food of a Chinaman can be provided at 1 1-2d. per day: I know their food well, having mixed with thousands of them abroad. The ore is the common oxide of tin in its original state; it is of a reddish brown color; about 1,400 tons are annually exported to the markets of China and Hindostan, (where it is preferred to the tin of Cornwall,) besides large quantities sent to all parts of the world. According to some accounts, the mines of Banca were not discovered before 1710, but I have been informed by the best authority that the Arabs carried tin to China in the ninth century. The tin is found lying frequently between a red ironstone and granite, which is the mother of the island; it is seldom found deeper than 4 fms., and frequently found so near the surface as 4 feet. From all the information I can get on the subject, they can supply it at a much less price than £45 per ton."

It must be borne in mind that the Banca mines have never been hard pushed in competition. What they might do, in the presence of dangerous rivalry, is only to be estimated. The present price of tin gives them a large margin of profit. Suppose the price should be reduced to a minimum, and the tin shipped directly to our shores.—to New York for the Atlantic and San Francisco for the Pacific market,—could the best American mines compete with them? We are not in a position to say: but we fear that a heavy tariff—much heavier than the present 15 per cent. ad valorem—would be called for.

CRITICISM EXTRAORDINARY.

We take the following from the San Francisco *Alta California* of Nov. 22d:—

"The *American Journal of Mining*, published at New York, is a valuable periodical, but it unfortunately contains many statements made with more confidence than knowledge. The following sample, in an editorial notice of a late book by J. A. Phillips, will astonish well-informed Californian miners and mining engineers:

'The author, apparently, forgets that the inventor of sodium amalgam never supplied the mills of California, and that almost all the sodium amalgam used in that State was unskillfully made and unskillfully handled. In spite of this, however, it is a fact that the new amalgam is largely used in California, and, according to high authority, with good results; only, as the miners did not care to be prosecuted for infringing the patent, they choose not to tell Mr. Phillips all about it.'"

The *Alta* apparently intends to contradict the statement we made; but unfortunately does not explain in what particular it is incorrect. We asserted:

1. That Prof. WURTZ did not supply the sodium amalgam used in California.

2. That almost all the experiments in that State were made unskillfully.

3. That, in spite of this fact, sodium amalgam is still largely used in the California mills, and, according to high authority, with good results.

4. That Mr. PHILLIPS was not aware of these facts.

To which of these assertions does the *Alta* object? They are all based on positive evidence in our possession, except the last, for which we have only our faith in Mr. PHILLIPS as a gentleman, who would not knowingly suppress the facts.

The mere astonishment of California miners and mining engineers is scarcely an adequate contradiction. We have great respect for those gentlemen as a class; they are surpassed in practical experience, in their particular spheres by no other body of men in the world; but they are so accustomed to hear wild and exaggerated statements, that we could never hope to "astonish" them in that direction. If we desired to astonish them, we should tell them the truth.

The *Alta's* opinion that our "valuable periodical" "unfortunately contains *many* statements made with more confidence than knowledge," remains to be proved. We await the *Alta's* vindication with more knowledge than confidence.

The *Atlas* "confidence" has been abundantly displayed. Let us have, by way of variety, a little of its "knowledge."

SQUARING THE CIRCLE.

A brilliant genius named WIMLLIAM HARVEY is publishing, in the *Mechanic's Magazine* of London, a series of letters on the quadrature of the circle, in which he claims to have discovered that the actual ratio of diameter to circumference is as 5 to 16, or in other words, 3.2 instead of 3.1159, etc. There are half a dozen mathematicians laboriously exposing his blunders in logic: but the great man, like his illustrious namesake, who discovered the circulation of the blood, is not to be put down by opposition. He expects, he says, to be freely criticised, for his solution of an inquiry, "which, 430 years before the Christian era, brought on the head of the celebrated Grecian astronomer Meton the coarse diatribes of the Grecian comic writer Aristophanes, in his comedy of the 'Birds.'"

Unfortunately, to be the victim of coarse diatribes is not always to be a second Meton: and Mr. Harvey cannot escape, by appealing to ancient history, the scornful laughter of the world. There are several very conclusive methods of proving this gentleman to be a fool. One is to go and measure the circumference and diameter of a wheel. Another is to analyze his own demonstration, which contains a huge geometrical absurdity. Perhaps the following argument is as conclusive as either. The periphery of a regular polygon of sixteen sides

circumscribed about a circle, the diameter of which is unity, is proved to be 3.18. According to Mr. Harvey, therefore, the circumference of the circle must be greater than the sum of the sides of the circumscribed polygon. On the same grounds, Mr. Harvey must be too big for his own boots!

We confess our surprise that the *Mechanic's Magazine* should give so much space, week after week, to the diagrams and lucubrations of this fanciful philosopher.

UNDERGROUND PHOTOGRAPHY.

An interesting account was published some time ago, of the experiments of Mr. CHARLES WALDACK, of Cincinnati, who succeeded in taking photographs of the interior of the Mammoth Cave, by the aid of the Magnesium light. The first experiments were made on the venerable stalactites in Gothic Chapel, one and a half miles from the entrance. The first picture was attempted with eight tapers. This was found too few, and the number was increased to fifteen, then to twenty-five, and for subsequent negatives as many as fifty to one hundred and twenty were burned at once. About forty satisfactory negatives were secured, nearly three months' time having been consumed in attaining this result. The excellence of the pictures, it is said, surprises none more than those who have visited the cave and are familiar with its many features.

Great credit attaches to Mr. WALDACK for this success; but we have to chronicle an achievement still more surprising. The whiteness of the Mammoth Cave, reflecting light in a high degree, is a material assistance to the photographer; and we might suppose it still impossible to obtain by artificial light a picture of the interior of a mine, especially of a coal mine. Yet this has been accomplished by Mr. MACDONALD, the well-known sculptor, of this city, who has made an examination of certain West Virginia and Ohio coal mines, and brought back pictures of the beds taken thousands of feet from daylight. The absorption of light by the dark coal is troublesome even in daylight photography; but the difficulty was very ingeniously and successfully overcome by Mr. M. and his assistants. As we expect to lay before our readers an account of this interesting matter from his own pen, we forbear further description.

The Bergen Explosion.

In another column will be found the scientific evidence, and the verdict of the coroner's jury, in the case of the Bergen explosion, by which nine lives were lost. The verdict is a very sensible one, and bears out the view of the matter which we have already maintained. The storage of nitro-glycerine in small quantities is of course to be recommended; and the fire-proof character of the storage-vault, though it has little to do with safety from explosion, (since the substance explodes by percussion, not by ignition) may prevent any wide-spread disaster after an accident of that nature.

NEW PUBLICATIONS.

THE AMERICAN NATURALIST for December contains an obituary notice of FRANCIS PEABODY, Esq., late President of the Essex Institute at Salem, a relative of GEORGE PEABODY, Esq., of London, and one of the administrators of the munificent endowments, established by the latter for the promotion of science in Essex County, Mass.; also, an article on "Desmids and Diatoms," by Prof. BAILEY; "A Botanical Excursion in My Office," by H. C. WOOD, Jr.; the conclusion of "The Quadrupeds of Arizona," by Dr. CONES, and the continuation of Mr. MORSE'S "Land Snails of New England," with the usual interesting Reviews and Miscellany, and a third instalment of the proceedings of the Burlington meeting of the American Association.

THE CHEMICAL NEWS (American reprint) for December, completes the first semi-annual volume. Those who desire to bind their files of this valuable journal would do well to secure this edition, in which the London advertisements are omitted, and the scientific matter is compactly presented.

NEW YORK RAILROAD AND STEAMBOAT TIME TABLES—*Benedict Brothers, Jewellers and Keepers of the City Time*, 171 Broadway. Everybody knows that in this neighborhood the sun goes according to BENEDICT'S regulator: and whoever would not be left behind by train or boat should have, first, BENEDICT'S time, second, Benedict's tables, and third, an invariable habit of punctuality. The pamphlet before us, neatly printed on tinted paper, contains many items of permanent interest; and, inasmuch as there is nothing which people peruse so much (next to the AMERICAN JOURNAL OF MINING) as their railroad guides, we are not surprised to find it adopted by numerous business houses as an advertising medium. In addition to the old stand, 171 Broadway, BENEDICT BROS. have opened stores at 691 Broadway and 234 Fulton street.

THE NATURAL RESOURCES OF MONTANA. We have received two interesting reports on this subject, one from the pen of Prof. A. K. EATON, the other by Prof. G. C. SWALLOW. Both these gentlemen have knowledge and high reputation; and we shall refer to their descriptions of Montana, together with the recent report of the Surveyor-General, more fully on a future occasion, when we can do them better justice.

Prof. W. P. BLAKE favors us with a reprint from SILLIMAN'S JOURNAL for July, of his brief but clear and attractive article on the glaciers of Alaska. Prof. BLAKE'S observations were made in May, 1863; and consequently he cannot be suspected of any undue bias of mind, arising from the reflection that the polar bears were his fellow-citizens, or the desire to obtain Russian or Indian votes for Congress. We quote a paragraph or two, by which the contradictory statements afloat, as to the climate of our new territory, are reconciled.

"On approaching the northwest coast of America from the west, the mountain chain of the interior is seen to be lofty and alpine in its character. The ridges are sharply serrated, and rise here and there into needle-like pinnacles, giving an outline against the sky that contrasts strongly with the gently sloping sides of the truncated cone of Edgecombe, a fine extinct volcano which marks the entrance to the harbor of Sitka.

"The rocky peaks of the interior rise above broad fields of snow, which give birth to numerous glaciers, while Edgecombe, and the ridges upon the coast, are in great part covered with a dense forest of pines and firs. No glaciers are found upon the coast at Sitka or south of it, for under the influence of the warm currents of the Pacific, the climate is comparatively mild, while a short distance in the interior, the winters are almost Arctic in severity."

MEETINGS.

American Coal Company at 111 Broadway, Dec. 26, between 12 M. and 10 P. M.; Schuylkill Navigation Company at 417 Walnut street, Philadelphia, Jan. 6 1868, 11 A. M., for election of officers for ensuing year; Hecla M. Company (of L. S.) at 114 State street, Boston, Jan. 10, 1868, 3 P. M.; Calumet Mining Company (L. S.) at 114 State street, Boston, Jan. 8, 1868, 3 P. M.; Allouez Mining Company (L. S.) at 60 City Exchange Boston, this day 3:30 P. M.; Toltec Mining Company at 24 City Exchange, Boston, Dec. 30, 12:30 P. M.

DIVIDENDS.

Wallace Oil Company at 319 Walnut street, Philadelphia, 1 per cent. on demand; Union Pacific Railroad Company, E. D., at 55 Exchange Place, interest on 1st Mortgage Bonds, payable on presentation of coupons; Savage S. M. Co. (Nevada,) $150 gold per foot on demand, at agency Bank of California, 32 Pine street.

ASSESSMENTS.

Chollar Potosi Silver Mining Company (of Nevada), $15 gold, per share, now due; Hale & Norcross Silver Mining Company (of Nevada), $150, gold, per foot.

Correspondence.

[To insure insertion of Correspondence in our columns the full name and address of the writer must be given.]

Additional Assays of Tin in St. Louis.

ST. LOUIS, Dec. 3, 1867.

EDITOR AMERICAN JOURNAL OF MINING:

Much has already been done to demonstrate the real value of the discovery of tin in Missouri. Various chemists have been employed in making assays of the ore. These experiments have been conducted in the presence of all who wished to see them made: and Messrs. Moody, Michel & Co. are evidently satisfied with the result, for they are working a large force at their mines. They have also secured an experienced Cornish smelter, who is now engaged in putting up a suitable furnace on their property. This firm will place beyond dispute the question as to whether the coveted metal exists here in paying quantities.

Dr. T. R. Goulding, of this city, has been very successful in extracting the tin from the ore, and I send you a report of some assays lately made by him.

Assay Number One was of a partially decomposed rock, of a light brown color, easily crushed, of which fourteen pounds was taken, crushed, washed and roasted, with a loss of six and a half pounds. The residue was treated for wolfram and iron for thirty hours, reducing it to ninety-two ounces, which, on being smelted, yielded five ounces of an alloy that on refining produced three ounces of good merchantable tin, being 1.34 per cent. from the crude ore and 3.26 from the washed stuff.

Assay Number Two was of a rotten dark green stone, easily pulverized. One pound of this ore was crushed, washed and roasted, which reduced it eight ounces. The residue was smelted, yielding a button weighing one ounce of tin and iron. Owing to the peculiar formation of this button, it was not refined, but was kept as a curiosity—The per centage was 6.24 and it was estimated that if refined it would be 3.12 per cent.

Assay Number Three was an assay by the humid process of a piece of dark green rock, which has clipped off from a lode that had just been uncovered.

The amount treated was two hundred grains. Being crushed, washed and roasted, it was dissolved in hydrochloric acid, evaporated, treated with nitric acid, and the chloride of tin converted into metastannic acid ($Sn O^2$) which weighed 12 grains, equal to 9.45 grains of pure tin.

Assay Number Four was of the same rock as Number Three. One pound and five ounces was taken and reduced five ounces by working. On smelting, it yielded three quarters of an ounce of tin equal to 3.57 per cent.

The fairness of the above assays will be certified to by our most respectable citizens. They however only prove the presence of tin. They are an imperfect measure of its quantity, because the specimens themselves were scraps of rock from the surface, selected by men who were not judges of the ore. They were pronounced by Dr. Goulding as inferior to any that he had examined from this property before. The experiments were made in an inconvenient place and with unsuitable appliances.

Hy. Maree de Beauregard was the first chemist in this city who pronounced in favor of the genuineness of the tin discovery. At our late fair in this city, he received a diploma for his assays of tin ores. Some assays have given seven per cent of metal. Some have given none. I send you the memoranda of one, which he informs me is a fair average of the results obtained by him.

The analysis was partially by the dry and partially by the humid process.

The weight of ore taken was 1,067 grains, which was found to contain

Tin	53 grains.
Oxide of iron	67 "
Molybdate of ammonia	3 "
Putty of tin, granite, silicious matters and loss	944 "

It will be seen that the result shows nearly five per cent. of chemically pure tin; but in estimating the profit of working this ore, it must be borne in mind that the tin of commerce is not chemically pure. FRANK H. FLETCHER.

[Mr. Beauregard's analysis is full of genius. Any man who discovers molybdate of ammonia in tin ore deserves a diploma, to say the least.—ED. AM. JOUR. OF MINING.]

Nitro-Glycerine.

The following evidence concerning the qualities of nitro-glycerine was given at the inquest in the case of nine persons killed by the recent explosion at South Bergen, N. J.:

Otto Burstenbinden, testified: I am now in the blasting business, and reside in the city of New York: nitro-glycerine is composed of nitric acid, sulphuric acid, and glycerine oil; it is a liquid of light yellow color, and about six-tenths heavier than water; in exploding it expands 10,400 times, and powder expands about 800 times; this compound called nitro-glycerine will not explode by simple contact with fire; it requires about 360 degrees of heat to make it explode; it will not easily explode by concussion or friction when fluid, but it changes its qualities entirely when frozen; if frozen it will explode very easily by a stroke or slight concussion.

Wm. H. White, testified: I reside in Syracuse, and for the past two years have turned my attention to the use of nitro-glycerine: I know that glycerine is no more explosive when frozen than when in a liquid state; frozen, it is less liable to explode; it is very hard to explode a cartridge when frozen: a very heavy weight coming on glycerine either in a frozen or liquid state would explode: I have seen a man let a can of frozen glycerine fall from his shoulder on a rock without exploding it; I consider nitro-glycerine twenty-five times safer than powder for blasting purposes; I have seen a chunk of nitro-glycerine as big as my hat cut open with an ax.

Prof. R. Ogden Doremus testified: I am Professor of Chemistry at Bellevue Hospital Medical College, and of the College of the city of New York; on December 2 I received from the Coroner two bottles of nitro glycerine, with a request to report upon its properties: I have subjected it to ultimate chemical analysis, and find it to correspond to the formula C. 6, H. 3, O. 3, and (N. O.) 5; it is well-made nitro-glycerine; the substance freezes at about 46; it is made to decompose in a very peculiar way: on moistening paper with it, it burns with rapidity; it does not explode when red hot copper is placed in it; we tried it with the most intense heat we can produce with a galvanic battery, with two hundred cells holding a gallon and a half each; some nitro-glycerine was placed in a cup and connected with one of the poles of the battery, through a pencil of gas carbon, the other poles of the battery were connected with the glycerine no explosion ensued; but when the point touched the brittannia vessel the nitro-glycerine took fire, a portion burning and the rest scattering about; this is as severe a test as we can submit it to in the way of heat under the pressure of the air; we therefore would conclude that nitro-glycerine carried about cannot explode, even if you drop a coal of fire into it; if the liquid is confined, or is under pressure, then an explosion will ensue; if paper is moistened with it and put on an anvil, and a smart blow given with a hammer, a sharp detonation ensues; if gunpowder or the fulminates of mercury, silver or gun-cotton be ignited in a vacuum, by a galvanic battery, none of them will explode; if any gas be introduced so as to produce a gentle pressure during the decomposition, seen a rapid evolution of gases will result; the results of decomposition in a vacuum differ from those under atmospheric pressure, or when they are burnt in a pistol, musket, or cannon, or a mine; where we have little or no pressure it is difficult to get these substances to burn rapidly; nitro-glycerine is more difficult to explode than powder; in many respects it resembles gun-cotton, which is made in a similar way: if gun-cotton be immersed in the proto-chloride of iron it turns into common cotton; the same experiment was made with nitro-glycerine by mixing it with proto-chloride of iron, and it reverted into common glycerine; there are four well-known varieties of gun-cotton made by employing acids of different strengths; they differ in chemical composition as well as in their explosive qualities; the late Minister of war in Austria in 1862 stated to me that he had ordered 400 cannon for gun-cotton, and six mo ths after he stated that he had ordered all the cannon to be changed and adopted to powder in consequence of spontaneous combustions; much less is known of nitro glycerine than of gun-cotton, and probably several varieties of this article may be formed as of gun-cotton; this would explain cases of spontaneous explosion; if the nitro-glycerine is not carefully washed to get rid of the acid, a gradual decomposition will ensue, producing gases, which, if the vessel be closed, will explode; my opinion is that nitro glycerine should be used in the most careful hands; do not think I would put it in the hands of a common laborer for blasting purposes; it is less dangerous in a frozen than in a liquid state; I think concussion would explode frozen nitro-glycerine.

At 5:40 o'clock P. M., the testimony being all in, the jury adjourned to 7 o'clock for the purpose of deliberating on the verdict.

The jury reassembled at 7 o'clock, when the following letter from Prof. Doremus was read to them:

"Since leaving you I have learned that the can of nitro-glycerine, the explosion of which proved so fatal, was full of frozen, or solid nitro-glycerine. Now, although the cork might have been removed, it is possible that the red-hot irons melted and decomposed the material at the bottom of the can, leaving a quantity of solid nitro-glycerine above, which, by preventing the escape of the gasses, produced the pressure required for an explosion. A red-hot iron, or the more intense heat of a powerful galvanic battery, will not explode the nitro-glycerine unless it is under pressure. This stopper of nitro-glycerine might have closed the orifice of the can sufficiently to produce the required pressure."

The jury being out over five hours, came in at 12:45 P. M. with the following verdict: "We, the jury, find that Thomas Burns, Hugh McKenna, Thomas Hicks, John Hicks, Benton Edwards, Frederick H. Miller, Robert Foster, John H. Miller, Patrick Riley, and Michael Cuff, came to their deaths on the 25th day of November last by the explosion of a can of nitro-glycerine, consequent upon the careless handling of the same by Thomas Burns, one of the deceased, and we censure the contractor, Col. Schaffner, for not being more careful in the selection of a man to use the article of nitro-glycerine, and recommend that in future men should be employed in its use who understand its explosive qualities, and we request the Council of the town of Bergen to order that there shall not be any more than 100 pounds of nitro-glycerine stored up or kept in the town of Bergen, the same to be stored in a fire-proof vault when not required for use."

The New Almaden Quicksilver Mines.

Mr. Charles L. Brace, writes to the New York *Times* of these mines as follows:—I visited, while in the Santa Clara Valley, the famous quicksilver mines of New-Almaden. They lie about thirteen miles from San Jose, on a range of hills some 1,500 feet above the valley. The rocks in which the cinnabar is found are magnesian schists. We ascended to the opening of the mine by a carefully-graded road, some three miles. Here half a dozen of us were put on an ore-car and pushed by hand through a level some eight hundred feet long into the centre of the mountain, where we entered a large chamber, made by the removal of the cinnabar. From this a vertical shaft descended nearly three hundred feet. The lower part of the mine is reached by ladders in various openings or cavities which communicate with one another by narrow passages. The bucket is also used for descent. One of these descending passages is forty feet high and seventy feet broad. The galleries are frequently heavily timbered, to sustain the rock above. Owing to the low price of quicksilver in the markets of the world, the production is by no means so extensive here as it has been. I believe a large portion of the laborers were then out of employment. The ores are usually extracted by contract, the price paid being from $3 to $5 per *carga* of 300 pounds. The laborers are mostly Mexicans. The mercury is extracted from the ores by condensation. The only preparation is breaking them by hand, in order to remove the unproductive rock. They are then thrown into brick furnaces, capable of holding from 60,000 to 110,000 pounds. The chambers are heated from a furnace on the side with wood fuel and separated by a wall of brick pierced with opening. The product of combustion is forced through alternate chambers above and below, until all the mercury is condensed. The furnaces are built on

double arches of brickwork and plates of iron, to catch all particles of the metal. Formerly much was lost in the earth. The metal begins to run in from four to six hours after the fires are lighted, and in about 60 hours it is discharged through the various condensing chambers into large kettles, where it is all ready for market. The total product of this mine, in 1865, was 47,078 flasks, or 3,604,464 pounds of quicksilver. The export during the last six months was 12,716 flasks, worth $423,200, or a decrease of 5,711 flasks and of value, $253,102 since 1866. Of these 12,716 flasks some 9,000 were exported to South America. The whole landed estate of the Company is over twelve square miles, of which about one-third is mineral ground. There are over 400 buildings and workshops on the property. The New Almaden Mine is now, we believe, the largest quicksilver mine in the world.

New Process for Saving Gold in Quartz.

A new process has been adopted in treating the quartz in Mariposa, in which the mercury is vaporized, and the result is said to be most satisfactory, the amount of gold saved being nearly three times as large as by the old process. The new process is described as follows in the *Alta Californian*:—"The process used at Mariposa consists of three operations, each covered by a patent right. Into a boiler iron barrel, having inside two thousand pounds of loose chiled iron bullets, three-quarter inch in diameter, are introduced eight hundred pounds of quartz which has been stamped dry and passed through a No. 20 screen. This barrel and its contents are revolved twenty-four times to the minute, with an estimated expenditure of at least six horse power, and in one hour the quartz is reduced to a dry powder nearly impalpable. It will mostly pass through a fine flour bolting cloth, say eight tons per twenty-four hours. From the barrel the dust passes into an upright iron cylinder, having inside a coil of perforated iron pipe. Into this cylinder is injected dry steam, which, under pressure, is forced through the perforated pipe, and permeates the mass of powdered quartz. It must be understood that the steam is superheated by being passed from the boiler through coils of pipe made red hot. In this condition it is intensely dry and invisible as air. Mercury is then introduced; and it is claimed that it is vaporised, and thus rendered so searching that no atom of gold escapes its attraction. A dome on the top of the cylinder is kept cool by outer water, and against it the rising vapor of mercury impinges and is thrown back in fluid globules, which again ascend in vapor, thus doing repeated duty. Finally, ordinary steam is let in, which wets the mass and restores the mercury from vapor to its normal state. This treatment lasts twenty minutes, and so subdivides the mercury that a peculiar shaking table is considered necessary to aggregate the particles of mercury, to make the necessary separations, and to bring the amalgam to its proper condition After this it is found necessary to pass it into pans, and to mull it up to more perfect amalgamation. The tailings are said to be entirely barren of gold, proving perfection in the process of reduction. No experiments have been made to prove how much of the great gain is due to fine pulverization, and how much to the mercurial vaporizer. They seem to be considered as a necessary combination to the success of each other. The patent shaking table seems to be necessary to gather up the mercury after the vaporizing process has scattered it. Otherwise there seems to be no reason why the ordinary pan mulling should not suffice, without the shaking table." The president of the Mariposa company reports that he has treated nearly one thousand tons of rock with unvarying average results. It is claimed that by this process the pulp is reduced to the utmost fineness, and that by vaporation of the mercury every particle of gold is taken up. The cost of working by this process is claimed not to exceed five dollars per ton. It is fair to estimate the average cost of milling by the old process, at $2 60 per ton, and if the additional expenses will add fifty per cent. to the savings, the new process will commend itself to all engaged in working quartz.

The Rival American Engines.

There were, probably, few branches of industry, in connection with which the Americans displayed a higher order of merit at the Paris Exhibition than in the steam-engine manufacture. Not only was there the great locomotive which attracted such universal admiration, but there were ordinary stationary engines which were beyond all praise—the Corliss and the Hicks being decidedly the most prominent. Which of the two is entitled to be regarded as preferable it is difficult to determine, and it would certainly require a series of very nice tests to settle the question. That this is the case was especially apparent at the recent California State Fair, where the two engines were exhibited almost side by side. The Corliss engine is a really beautiful piece of mechanism, and by its nicety of adjustment of regulator, cut-off, &c., a saving of fully 30 per cent. in fuel is claimed for it over most other engines. The cut-off adjustment takes place twice with every revolution of crank. Several ends of great importance are claimed to be secured in this engine, chief among which may be mentioned the rapid and wide opening of the valves in the cut-off, and their almost instantaneous closing. By this means the greatest possible amount of power is derived from the least quantity of steam. The automatic action of this engine has, probably, reached a greater degree of perfection than is found in any other in use, which is a great advantage where fuel is scarce and labor and mechanical skill are cheap, but it cannot be denied that the engine does require the attention of a skilled workman in order to make it yield the best results. The Hicks engine owes its popularity to its extreme simplicity, which is very generally considered to be a full compensation for the greater economy of its rival. It is an engine without either valves, valve-rods, eccentrics, rock-shafts, packing boxes, slides, cross-heads, or even piston-rods. It is constructed with four cylinders, set in pairs, with a crank-shaft running between them. By curiously connected parts and passages, and a novel connection of the pistons with the crank-shaft, the steam is admitted directly into two of the cylinders, first acting upon their own pistons, and next with a new supply, transmitted through them into the other two. Each piston having performed its share in urging forward the revolution of the crank, immediately becomes itself a slide-valve, to govern the inlet and outlet of steam to its neighbor; at the same time each piston acts as a *cut-off* to its own cylinder, stopping the supply at half stroke, and accomplishing the balance of the stroke by expansion, aided by a full head of steam in another piston. By this latter arrangement every half stroke is produced by a conjoint action of full and expansive steam. It is claimed that the advantages possessed by the engine are great economy in space and weight, a great reduction in friction, extreme simplicity in construction, superior durability and saving in repairs, more rapid valve motions, and impossibility of getting the cylinder out of line. So nearly were the respective merits of the two machines considered to counterbalance each other, that a first premium was awarded to each—to the Corliss engine for economy in the use of fuel, and for the ease and certainty with which its motions can be regulated; and to the Hicks engine for simplicity of construction, economy in space, facility of transportation, and little experience required to operate it. As efforts are about to be made to introduce both of these engines in this country to a much larger extent than at present, for there are already some excellent specimens of each in use, this brief notice of their merits cannot fail to be interesting.—*London Mining Journal.*

The Postal Telegraph.

We shall now have an opportunity to see the practical workings of a postal telegraph system. We believe it would be an excellent system for this country, but are very glad to have England try it first. The English proposition, now under consideration, for the government to own and control the railroads of the country, has objections which do not belong to the governmental control of the telegraph lines. There is little or no machinery connected with the electric telegraph; no large amount of property to be manipulated; few employes are necessary, and no great contracts, by which the government can patronize its friends. One or two operators at each office would be a small addition to the postal office forces of our large cities. One corner of a room would be all that would be required for this little clicking novelty, except at great centres like New York. At such places the telegraphic department would be a very large and important one, but everything would be under easy control of a superintendent. There would be nothing to compare with the thousand and one ramifications of the ordinary post-office business—mail-bags, horses, porters, boxes, railroad cars, money safes, and agents. We can see no objection whatever to the introduction of the new system into this country. The government could afford to send dispatches at rates as much lower than those of private corporations, as the latter rates are lower than express charges. The government could do this, and make money by it. That the United States will adopt this system there is no possible doubt: the question is whether it will do it now or wait five years. In ten years from now we will be wondering that we could ever dispense with such a convenience, as we now wonder at the inconvenience which our fathers tolerated in the old postal system, with its high rates and uncertain movements. England has the start of us in this improvement, as she has had in many other improvements, despite our Western enterprise. We trust we will not be far behind her, however. As long as the present companies can control the opinions of Congress on this matter, of course we shall depend on competition only for tolerable accommodation and moderately exorbitant rates.—*N. Y. Evening Mail.*

Copper Mining.

A California paper discourses upon the condition and prospects of copper mining as follows: One of the chief demands of copper of late years has been for locomotives. There is, on an average, one engine for every three miles of railroad, and two tons of copper are put into every large locomotive, so that three miles of railroad demand two tons of copper. In times when railroad construction is busy, the copper market is brisk. But just now the only noteworthy railroads in progress are the Pacific and several in Spain. Russia, France, Germany, England, India, and the States east of the Mississippi, have nearly finished their railroad work, for a time at least; and Asia, Africa, South America and Mexico have not commenced. Their time is coming, however, and copper mining will be brisker than ever. The effect of the present depression may ultimately be decidedly beneficial to California. Many mines in Cornwall, which have heretofore yielded large quantities of copper ore, are now lying idle, and are filling up with water, and some of them—perhaps a considerable proportion of them—will never be reopened again, for the expense of pumping and retimbering would be more than their low-class ores could pay, while the high-class ores of California, Arizona, Chili and Australia will probably, at no distant time, drive even the best Cornish mines out of the market. The depression which affects our mines affects those of Chili as much: and if we had to-day a railroad to our chief copper districts, abundant water there for concentration, and freights to New York as low as they were eight years ago—all of which we shall have—we should be able to ship three times as much ore, and make three times as much profit per ton as at present.

Remarkable Galena.

Mr. F. Schirmer, a Colorado metallurgist, writes to the Denver *News* as follows: Allow me to publish for the benefit of the miners and mineralogists, a few lines in regard to an extraordinary rich argentiferous galena which occurs in the "Terrible lode," at Greensteown.

First assay made yielded coin value			$3,195 00
Second "	"	"	3,125 00
Third "	"	"	3,572 00

per ton of 2,000 pounds avoirdupois. A massive body of galena was struck at a depth of 50 feet from the surface. The main bulk is a fine grained, solid mass, one foot thick, which gives the above high results. Smaller veins scattered through the crevice at this depth, coarse grained, of a cubical cleavage and granular structure, would, if concentrated, make up a solid ore vein of two feet. A number of assays made from this latter ore gave, as lowest result, $714 coin value. The silver contained in this galena is combined with sulphur as sulphuret of silver, but cannot be distinguished even by the aid of the microscope, being so fairly intermixed with the whole mass. The amount of silver contained in galena varies ordinarily between one-tenth of one per cent. and three-tenths of one per cent. reaching, sometimes, one-half per cent., rarely above one per cent. Malaguti, an eminent French metallurgist, reports to have found once galena containing seven per cent. of silver, which is the richest yield on record. By the above it will be seen that the samples of the Terrible lode yield as high as nine per cent. A few facts in regard to this valuable lode, I think, will be of general interest. It is situated on Brown mountain, about nine hundred feet above the wagon road to West Argentine. The width of crevice is four feet; vein of solid ore on surface about eight inches. This ore is a dark ferruginous zincblende, containing one-half per cent. of silver. This body of ore at a depth of twelve feet, is sixteen inches thick; at a depth of forty feet twenty-two inches. The size of shaft is four by eight, and upwards of fifty tons of ore were obtained in digging to this depth. The average yield of this pile of ore was found to be $180 per ton. It consists chiefly of zincblende, some galena, and iron pyrites. In sinking deeper, the ore vein kept its strength, but galena increased, and at the present depth of fifty feet, the above rich galena was struck. The wall-rocks of the lode are solid, well defined and smooth, and the whole vein is of a crystalline nature. The collection of the ore is massive. These are all characteristic features of a true and regular lode. The vein has been opened, besides the discovery shaft, at two other points, twenty-five and seven hundred feet from the former, showing in both places a strong and well-defined lode.

New Quicksilver Mines in California.

The *Recorder* has the following relative to the quicksilver prospects in Napa county: We returned on Wednesday from a visit to the mining district in the upper part of Pope Valley, and were agreeably surprised to see how much work was in progress toward prospecting and developing the quicksilver mines in that region. Gangs of men are hard at work upon three different claims, and upon two of them a large quantity of excellent cinnabar had already been taken out, and there is a most flattering prospect of an inexhaustible supply. We are assured by old miners, familiar with quicksilver working, that no mine yet opened upon the continent ever afforded so favorable a prospect at the outset, as at least one of the claims in question, and from appearances and information, we are confident they are right. As there is not a foot of stock in market, or likely to be, there can be no impropriety in speaking as we think of the great discoveries recently made. A furnace for reducing the ore is to be erected as soon as the castings and other iron work can be placed upon the ground. The foundations and frame-work are ready, and a dam and sluiceway for furnishing water are nearly completed. Houses for workmen, carpenter's and blacksmith's shop, and barns and sheds for horses are also ready, and the furnace is expected to be in working order within four or six weeks. The iron work has been manufactured in San Francisco, and will probably arrive here next week. The capacity of the furnace is stated to be eight tons per day, and there is already above ground a supply sufficient for several weeks, with plenty more in sight. With a large force of miners there would be no difficulty in supplying several furnaces. If the prospect continues as favorable as at present, others will be erected in the spring. There is but one opinion among all who have examined the mines, and that is highly favorable. We should not be greatly surprised if, within five years, an area of two miles square in Pope Valley should furnish quicksilver, of greater annual value than the wheat crop of the country.

Geology of Russian America.

Mr. William H. Dall, Chief of the Scientific Corps of the Western Union Telegraph Company, has written an interesting account of the geology of Russian America in the regions explored by him. He had obtained a set of the rocks from Fort Youkon to the sea, sufficient to determine the geological formations for 1,300 miles. The following are items of interest from this report: "The only fossiliferous beds are on the Youkon, and extend about six hundred miles—brown sandstone, containing bivalves, mollusca and vegetable remains. They are rare—only found in thin layers—and it took several months of searching before I found any. There is a small seam of coal thirty miles below the bend, and thin shale above and below. Very few and poor vegetable remains are found here resembling fuci. The coal is of good quality, but so little of it that it is worthless. These are the only fossiliferous strata I have found so far. The rocks above and below are all azoic and non-stratified, except a little hard blue or black slate. Granite, and especially mica, are very rare. I found a pebble containing the well-known fossils of the Niagara limestone on the beach near Fort Youkon. Fossil wood, bones and teeth of *elephas* and *ovibus moschatus* (elephant and musk ox) are common all over the country. There is a broad patch of volcanic eruptive rock on the river, near the lower bend, and it extends to the sea. The Islands of St. Michael and Smart are formed of it, and it is roughly columnar on the former, near this fort. The columns are five-sided, and just on the beach."

Another New Quartz Mill.

The Nevada *Trespass* gives the following account of a new mill process invented by Col. Collins of Virginia City: The invention consists of a series of cast iron wheels, each wheel constituting a cylinder similar in its operation to a Freiberg barrel; with the addition of the pan process, by the use of heavy iron cylinders inside, while the wheel, in rotating upon its bed, also accomplishes the crushing action due to the Chili wheel. The wheels are rotated by a heavy circular plate, which surmounts and rests upon the wheels; by which means the driving power is applied to their circumference, instead of their axis. A large amount of intervening machinery and friction is thereby saved, and, of course, much less power is required. It is estimated that silver ore can be crushed and amalgamated by this machine for $3 per ton, with a mill of a capacity for reducing 100 tons for each 24 hours, while the space which the machine would occupy will not exceed 20 feet square. The first experiment made with it was the reduction of 1,200 pounds of ore, with a result of 70 per cent. of the assay. The quicksilver was in the pulp but one hour, when it should have been there three hours. The result obtained under such circumstances shows not only the superior effectiveness of the machine, but that it will work exceedingly close to the assay.

Patent Claims.

Interesting to Miners, Millmen, Metallurgists, Oil-Men, and Others.

71,619.—MODE OF TREATING PETROLEUM TO REMOVE THE MORE VOLATILE PORTIONS.—Fleury Huot (assignor to himself and Jno. Rogers,) New York city.

I claim subjecting petroleum and other oils to the action of air, while such oil is in a finely comminuted or atomic condition, as and for the purposes set forth.

71,620.—MODE OF CONVERTING ARTICLES OF IRON INTO STEEL.—Richard A. Jackson, Lawrenceville, Pa.

I claim the use of the ingredients herein named, when compounded and used in the manner and in about the proportions herein described, and for the purpose set forth.

71,632.—CONSTRUCTION OF CORRUGATED SHEET METAL BOILERS.—George R. Moore, Lyons, Iowa.

I claim the longitudinal braces, B B B B, or their mechanical equivalent, in the form of longitudinal bolts or bars, substantially in the manner and for the purposes herein set forth.

71,751.—MANUFACTURE OF IRON.—David W. Hendrickson, New York city.

I claim the use of zinc or zinciferous ores, manganese, or the Franklinite ores, as a flux or a mixture in iron furnaces, in combination with the compound blast of superheated steam and air for manufacturing iron suitable for the Bessemer process of and for manufacturing steel and other purposes, substantially in the manner and for the purpose herein set forth, and shown in the accompanying drawings.

71,761.—STEAM ENGINE GOVERNOR.—R. K. Huntoon, (assignor to himself and Charles S. Lynch,) Boston, Mass.

I claim the arrangement and combination of the lever, C, rod, C', and

weight, h', with the shaft B, its propeller or propellers, D, the vessel, A, the ratchet, r', sectional frame, s, the pawls, t u, the rocker frame, b', and its cams or lifters, c' d', such ratchet being applied to a shaft, d, and the whole being substantially as specified.

Also, the combination and arrangement of the oil receiver, c, its eduction hole, e, and air pipe, f, with the governor as described.

71,776.—FURNACE FOR ROASTING AND REDUCING ORES.—Jabez Maunton, (assignor to himself, Wright Duryea, Wm. Ennis, J. H. Van Riper, A. P. Cummings, and J. Wendell Cole,) New York city.

I claim, 1st. The combination in connection with a reversible draft in or through them substantially as described, of reducing chambers, E E, and an intermediate fuel chamber, F, severally chargeable from above, and communicating with each other at or near the base essentially as and for the purposes herein set forth.

2d. The combination, with a reversible draft essentially as specified, of regenerators, D D, reducing chambers, E E, and fuel chamber, F, connecting with the reducing chambers by passages at or near their base, and chargeable as well as the reducing chambers from above, for operation as herein set forth.

3d. In combination with a reversible draft and fuel and reducing-chamber or chambers, the vertical regenerators, D, D, having their inlet and outlet passages connecting with the draft, arranged below substantially as described.

4th. The connection of the reducing-chambers, E E, with each other by a covered passage, G, arranged to pass through an intermediate fuel chamber, essentially as herein set forth.

5th. The arrangement in connection with the reducing-chambers, E E, of an air pipe or passages, J, arranged to connect said chambers at or near their top, substantially as and for the purpose specified.

71,786.—ROTARY PUMP.—John Poppe, Green Point, New York.

I claim, 1st. The combination of the flanged plates, a1 and a2, of the case, A, interior gear wheels, D and E, and piston head, H, with each other, said parts being arranged substantially as herein shown and described, and for the purpose set forth.

2d. The combination of the valve, I, operated from the drive shaft, F, to allow the piston head, H, to pass, and dropping again into place in the rear of the said piston head, to close the passage, G, substantially as herein shown and described.

3d. The combination of the gear wheel, V, and gear wheel, T, having a projection or cam, X, formed upon its side, and vertical sliding or lifting bar, P, having an inclined shoulder, p', formed upon its side for the cam to operate upon, with each other and with the drive shaft, F, and valve, I, substantially as herein shown and described, and for the purpose set forth.

On-dit about Minerals, &c.

☞ Among the papers presented before the geographical section of the British Scientific Association, at its recent meeting in Dundee, was one by a Frenchman, De Puydt, who was sent out by the French Government in 1865 to make an exploration of the Isthmus of Darien for the purpose of constructing a ship canal. You remember that an exploration was made, before the rebellion, of the Atrato river, by the American Government, and that the party under Lieut. Strain suffered terrible hardships. The party under De Puydt, instead of going up the Atrato, took a small stream called the Tenally, which on some maps is put down as one of the mouths of the Atrato. He found no difficulty in going up the banks of this stream through the forests to the Cordilleras, which, at the head-waters of this little river, are completely broken down into a plateau, which is estimated to be one hundred and forty feet above tide-water. The plateau or water shed between the Atlantic and Pacific is about five miles in width only. The explorer did not go across to the Pacific, but he states that he had an unobstructed view of the whole country westward, the Plains of Darien reaching all the way to the Pacific. No measurements were taken of distances or heights, and the elevation is only an estimate from the rapidity of the current of the Tenally river. The Indians were friendly and his party did not suffer from sickness or hardship.

☞ The Honolulu *Advertiser* publishes an account of the discovery of land, hitherto unknown, in the Arctic Ocean, by Capt. Long, of the whaleship Nile. It is thought this territory will prove to be the Polar continent so long sought after. The past season has been the mildest which has been experienced by the oldest whalemen, and Capt. Long was able to reach the latitude 73 30. He examined the land attentively along its entire Southern coast, which he sketched. It appears to be quite elevated, and has a mountain near the centre, about longitude 180, resembling an extinct volcano, and estimated to be about three thousand feet high. Captain Long named the country Urongelli's Land, after a Russian Emperor. The western point of the coast, in latitude 70 deg. 46 min. north, longitude 78 deg. 30 min. east, he named Cape Thomas, after the seaman who discovered it. The south-east point he called Cape Harran. The Nile sailed several days along the coast and approached within fifteen miles of the shore. The lower part of the land was tree from snow, and appeared to be covered with vegetation. It was impossible to tell how far the land extended northward. Ranges of mountains could be seen until they were lost in the distance.

☞ A Mexican correspondent of the New Orleans *Picayune* writes as follows:—A company of Frenchmen are engaged on a very singular enterprise in this city, which partakes very much of the character of the "Martha's Vineyard" search after hidden treasure. The parties spoken of have purchased the old convent San Domingo, and are at work excavating tunnels beneath the same, hunting for treasure supposed to have been put in secret vaults, said to exist there, by the Catholic priests some years ago. They have already made the discovery of an underground passage leading from the convent to the massive pile of buildings known as the "Inquisition," standing on the opposite side of the street. Several bodies have been exhumed already, which bear the appearance of having been buried alive. They have thus far been found enclosed in the walls. One was in a perfect state of preservation, and had the appearance of having been a man of rank. His clothes even were almost wholly intact, and were richly embroidered in gold. The priests of the city are greatly annoyed at these revelations, and have made many efforts to stop them.

☞ A cargo of about 220 tons Saghalien coal has been imported into the San Francisco market by Freeman, Smith & Co., from the Island of Saghalien, East Siberia. It has been practically tried by some principal blacksmiths and foundrymen, and proved to be of superior quality both for steam and forging purposes, and it is thought that it will become a regular and valuable article of importation, as its high cooking qualities, freedom from sulphur and nature of the ashes (its forming no slag), speak strongly in its favor. We subjoin an analysis made by the Pacific Chemical Works: Specific gravity, 1.288; volatile combustible matter, 35.70; fixed carbon, 56.45; moisture, 1.8; earthy matter, 6.05; gas evolved by ten pounds averdupois; coal, thirty-two cubic feet.

☞ The Colorado *Times* of the 26th ult. has the subjoined:—"One of the largest masses of argentiferous galena ore ever taken out from the mines of Colorado was brought to the surface of the Leavenworth lode yesterday by men working for Bolden & Bent. It weighs nearly six hundred pounds."

☞ The Dubuque (Iowa) *Times* says:—"We have in this State an unexplored mining field nearly seventy miles square, which has been merely scratched on the surface at a few points, and over $50,000,000 value of lead has been raised. The wonder is that our lead region does not attract greater attention from the mining adventurer."

☞ Immense deposits of valuable phosphates, said to be superior to Peruvian guano, and of incalculable value, have been discovered on the banks of the Ashby river, near Charleston, S. C.

☞ Three large ingots of gold from the Levis gold mine, Georgia, valued at $4,500, the product of one week's work at the rate of $1,100, were recently exhibited in Washington.

☞ Oil tubes have been laid across the Alleghany river to facilitate the shipment of petroleum. They are imbedded in the bottom of the river.

Special Scientific Brevities.

☞ A foreign chemist has invented a simple process for obtaining ice. He pours water into a bottle until it is half full, and then subjects it to the action of an air-pump. As the vacuum is produced, the water loses the air it contains, and is at length vaporized. The air and steam drawn off pass through a cylinder contain sulphuric acid, which instantly absorbs all the watery particles as they pass. The outside of the bottle is soon covered with dew, the temperature of the water falls, a few needles are seen swimming about in it, and immediately afterwards it loses its transparency, and ice is obtained. A kilogramme of sulphuric acid will produce nearly three pounds of ice in this way.

☞ A thin shell of a metal, such as copper, brass, bronze, silver, gold, etc., which, from its costliness, may not be available for a desired purpose in solid form, may be filled in with molten iron without melting, or even tarnishing, if it is immersed in water. The utility of this method is obvious in cheapening ornamental furnishings of almost all kinds. Another method for coating iron with copper is to plunge it into a boiling solution of a compound of copper with an organic acid (such as the double tartrate of copper and potash,) with excess of alkali, and holding it with a brass wire during the immersion, which may be longer or shorter according to the thickness of coating desired.

☞ The process of galvanizing iron, as practiced in one of the leading establishments of Philadelphia, is as follows: Selected sheets of iron after being trimmed to requisite size and cleaned by a weak acid solution, are rolled smooth, then dried in an oven and each sheet placed in contact with zinc. Both metals are raised to unequal heat and thus fusion is effected. The regulation of the heat necessary to metallic combination is a point of nicety and care.

☞ Artificial grindstones are manufactured in England of sand, made slightly cohesive with silicate of soda, moulded under uniform force, and afterwards saturated, and indurated with a solution of chloride of calcium, under Ransome's patent for artificial stone. A pair of these grindstones were recently tested in comparison with Newcastle stones, and found to perform in sixteen minutes the work for which the latter required eleven hours.

COLLINS & CO.'S
NEW PATENT SCREW WRENCH.

All consumers have noticed that their wrenches first fail by reason of the forcing back of the handle, and by the springing of the bar. Our improved wrench remedies both these defects, the bars being finished wider than any other wrench in market, and the handle cannot be displaced, as all strain on it is prevented by the screw thimble, D, (see cut.) Already adopted as the best by the principal railroads and machine shops, and for sale by Hardware Dealers generally. Address COLLINS & CO., 212 Water street, New York.
10:v4:xm

☞ An inquiring German has been trying nitro-glycerine internally, to ascertain whether it is poisonous. In large doses it caused death in animals, acting chiefly on the brain. The experimenter, getting accidentally more than he meant to, suffered severely from headache, giddiness, and partial loss of consciousness, but experienced no very alarming symptoms.

☞ A Mr. Sibert, of Staunton, Va., has, it is stated, discovered a process for converting iron ore directly into cast steel by a single operation in an ordinary furnace. This gentleman is now laying a number of steel rails made by this process on the track at Staunton, and we may hear more from them hereafter.

☞ Pouillet measured the temperatures corresponding to the colors which metal takes when heated in a fire, and found them to be as follows: Incipient red, 525 deg. Cent.; dull red, 700 deg.; cherry red, 900 deg.; dark orange, 1 100 deg.; white, 1,300 deg.; dazzling white, 1 500 deg.

☞ M. Mousson has found that a powerful pressure not only retards the freezing of water, but prevents its complete solidification. In this case the pressure opposes the the tendency of the water to expand on freezing, and thus virtually lowers the point of solidification.

☞ Dircks and Pepper are fighting over the invention of the "Ghost." Dircks' stabs are keen, and Pepper's replies are hot. Meanwhile the spirit which so promptly came from the vasty deep when called, don't know who called it. "Alas, poor ghost."

☞ The Berlin journals state that the Prussian government has determined on trying a number of revolving cannons, on Gatling's system.

All Sorts.

☞ A railroad convention, for the purpose of aiding in the completion of direct railway communication between the capital of the nation and the Northwestern States via the Potomac Valley, Hagerstown, Maryland, London, Fort Littleton, Fort Shirley, Tyrone City, and Clearfield, to Erie, Dunkirk, and Buffalo, met in the Court-house in Huntingdon, November 15, 1867, when John Williamson, Esq., was called to the chair; Hon. David Clarkson, Gen. F. H. Lane, and J. Sewell appointed Vice-Presidents, and Robert Gerhett, R. B. Peterkin, and P. M. Lytle, Esqs., selected Secretaries. The Chairman having stated the object of the meeting, it was resolved that John Dougherty, J. S. Stewart, R. B. Peterkin, W. B. Leas, and T. F. Orbison be a committee to build a railroad from the Cumberland Valley railroad, via. London, in Franklin county, and the Aughwick Valley, in Huntingdon county, to the Pennsylvania railroad, and present the same to the legislature of Pennsylvania, and also to call public meetings at such times and places as they may deem advisable in order to secure concert of action by the friends of this work and effect its success. A map was exhibited to the meeting, by which it appeared that only two links are wanting to effect direct railway communication from the lakes to Washington, by which Western travellers will be saved one hundred miles; the one is the link above mentioned, about forty-five miles in length, and the other is from Clearfield to the Buffalo and Erie railroad near the Philadelphia and Erie railroad, about thirty miles in length. The trade of the West Indies and the Southern Atlantic States, and that of the lakes, could then interchange by short and direct communication.—*Chambersburg (Pa.) Repository.*

☞ The number of ironworkers in Prussia is 37,000, or double the number of 1846. There are 655 iron works of various kinds, chiefly in the neighborhood of Aix-la-Chapelle, Cologne, Dusseldorf, Bobbentz, Reves, Arnsberg and Berlin. In 1865 the works produced 693,137 tons of pig-iron, 47,000 tons of raw steel iron, 187,400 tons of cast iron, 404,250 tons of rolled rod and bar iron, 75,450 tons of plates, giving a total value of £3,843,000, or an increase of £2,314,000 upon the iron produced in 1861. The manufacture of steel has made great progress during the past few years. In 1861 only 33,340 tons of steel were produced, but in 1865 the amount was raised to 97,550 tons. Thus the amount of manufactured steel has trebled itself within four years. The chief seat of this manufacture is in Westphalia, and on the Rhine, only a few works being scattered throughout the Eastern provinces. The famous cast-steel factory belonging to Mr. Krupp, at Essen, Dusseldorf, employs, alone, eight thousand workmen, and turns out 50,000 tons of steel annually, a quantity more than one-half of the entire produce of the kingdom. Prussian steel improves in quality every year, and is said to be little, if at all, inferior to English make. The development of the steel trade is due to the demand for the refined metal for military and railway purposes, and also to the construction of metal works for carrying on the processes of hammering, rolling, and boring.—[From Trade Review.]

☞ A Colorado paper gives the following concerning the Austin Coal bank, situate on Coal Creek, two miles above its junction with the Boulder, about twelve miles east of Boulder city. The working, by tunnel, is now 1,300 feet deep, 50-feet breast, eight feet in thickness. The tunnel struck the bed 210 feet from place of beginning. It was nine feet thick, in two layers, separated by eight to ten inches of a soft clayey substance, which cuts out easily and cheapens the cost of working. For a while they carried a 50-foot breast, but narrowed it from prudential motives. At present they leave a coal roof, it being the hardest formation for that purpose. The soil is 50 feet deep on top of the coal, and growing deeper as they go in. Wagons drive into the tunnel to load. The coal is said to be of excellent quality. Mr. Henry Briggs now works it for an Eastern company, selling as fast as broken at $5 a ton. Coal brings $13 a ton in Denver.

☞ We are in the habit of priding ourselves on the possession of the largest trees in the world, but recent researches in Australia have shown that although the thickness of our California giants may not be equalled, their height is considerably exceeded by species of *Eucalyptus*, a vegetable form characteristic of Australia. Specimens of various heights have been measured, and the tallest actually subjected to this test gave an altitude of 480 feet; but another, having a circumference of 81 feet at a height of four feet from the ground, was estimated to be over 500 feet high. The tallest spire in Europe, the Munster of Strasburg, is 466 feet high; the great pyramid of Cheops is 480 feet; but exceeded by these Australian trees.

☞ Professor Morlot, who for some years filled the chair of geology in the Academy of Lausanne, and died a few months since, left a curious will, one of the conditions of which was that his head should still be useful to science after his death, and he directed that it should be preserved in the Museum at Berne, with his name legibly engraved on the skull, so as to prevent its ever being mistaken for any other. This condition has been complied with, and the skull of the once active thinker, inscribed as desired, may now be seen in the anatomical department of the collection at Berne.

☞ A telegram of the 1st inst., says that "the track of the Central Pacific Railroad has been laid from Cisco to the summit, and through the great tunnel, over 7,000 feet above the sea. The first passenger car passed through the tunnel yesterday. Twenty-four miles of the track has been laid on the east side of the mountains. With a fortnight of open weather, the gap of six miles will be filled up, when a connection will be made with the lower track, 130 miles east of Sacramento.

☞ It is noted as a fact in casting steel to patterns, that a Sheffield (Eng.) firm have cast a hydraulic cylinder eight inches in diameter and two and a-half thick, perfectly sound and malleable. The Wm. Butcher Steel Works, Philadelphia, Pa., have recently cast a hydraulic cylinder 12 inches in diameter and but one and three-fourth inches thick, perfectly sound and malleable, which is a much more difficult casting to make, on account of the thinness of the metal.

☞ It appears from the records of the Patent Office, that in 1864 the number of applications for patents was 6,000; in the following year the number increased full fifty per cent; in 1866, 15,000 applications were filed, and this year will probably increase the number to 25,000. The number of caveats filed last year was 2,700, and this year there will be upwards of four thousand.

☞ It has been calculated by Professor Breithaupt that during the six hundred and forty years which they had been worked, dating down to 1825, the mines of Freiberg produced not less than eighty-two thousand hundred weight of silver, and that the amount yielded in 1859 alone was not less than eight hundred thousand thalers.

☞ The insuring of steam boilers and other property affected from explosions, is the object of a new company recently started at Hartford, Conn. Heretofore, there have been no companies in this country which have issued policies covering this class of risks, although in England they have been in successful operation for a number of years.

☞ The following is given as a remedy for sea-sickness: Make a mild decoction of the bark of the wild cherry, about the strength of breakfast tea, and take a wineglass full before every meal for three days before going to sea; on the last day take a mild aperient.

Special Notices.

Valuable Colliery.

We call attention to the advertisement, in another column, of Mr. HENRY CARY BAIRD, well known as the publisher of numerous valuable manuals of theoretical and applied science, and also, for some twenty years as a proprietor of coal lands, who offers for lease a colliery, in full working order on a large scale. Mr. BAIRD assures us that he considers this mine one of the best in the United States.

Machinery for Sale.

Messrs. SELOR, SWAN & Co., of the Manhattan Metallurgical Works, in Twenty-eighth street, offer for sale some second-hand quartz-milling machinery, of approved reputation, including a Hepburn pan. See advertisement.

COAL.

ENGLISH COAL AND CANNEL.
DESPARD COAL, from Baltimore,
PROVINCIAL COAL,
ANTHRACITE COAL,
For Sale in Lots to suit.
PARMELE BROS.,
AGENCY OF GEORGE WRIGHT & CO., LIVERPOOL.
Office, No. 32 PINE STREET, NEW YORK.
31:qp9 Yard, West 22d Street, near 10th Avenue.

REPPLIER, FREEMAN & CO.,
MINERS AND SHIPPERS OF
REPPLIER'S LOCUST MOUNTAIN, DUNCAN RED ASH,
AND
CUMBERLAND COALS.
WHARF, NORTH EIGHTH STREET, WILLIAMSBURG.
Office, - - - - - - 111 Broadway, New York.
1:1qp

RANDOLPH BROTHERS,
SOLE AGENTS OF THE ORIGINAL
SPRING MOUNTAIN LEHIGH COAL,
Extensively Used for Smelting Iron.
ROOMS, 28 AND 30 TRINITY BUILDING, NEW YORK 3:2 9l 6

DAY, HUDDELL & CO.,
MINERS AND SHIPPERS OF
HARLEIGH LEHIGH COAL,
And the Celebrated
HICKORY, BROAD MOUNTAIN, EXCELSIOR, SHAMOKIN AND NEW ENGLAND RED ASH.
OFFICES:
Room 31, TRINITY BUILDING, 111 Broadway.
Philadelphia. 109 WALNUT STREET. Boston. 7 POANE STREET.
15:qp

JOHN WHITE & CO., SHIPPERS OF
McNeal, Wilkesbarre and Lehigh Coal,
FOR STEAM AND FAMILY USE.
OFFICE,
Room No. 75, 111 Broadway, (Trinity Building,
Broadway, N. Y.
Jno. White. 3:1qp9 Louis T. Snow.

ASHBURTON COAL CO.,
MINERS AND SHIPPERS OF
LEHIGH COAL,
Delivered direct from the mines, or for reshipment at Port Johnston.
LOUIS J. BELLONI, Jr., Prest.
2:4qp OFFICE, No. 41 PINE STREET, NEW YORK.

A. T. STOUT & CO.,
MINERS AND SHIPPERS OF
"FULTON" AND "STOUT" LEHIGH COALS,
FULTON LUMP,
(Especially adapted for smelting Iron.)
ROOMS, 44 & 46 TRINITY BUILDING, NEW YORK.
A. T. STOUT. S. VAN WICKLE. G. LEE STOUT.
1:3.50

HONEY BROOK COAL COMPANY,
Exclusive Miners and Shippers of the Celebrated
HONEY BROOK LEHIGH COAL,
NO. 113 BROADWAY, NEW YORK.
JAS. H. LYLES, Agent
Wharves, Port Johnston, N. J. Philadelphia Office, 209 Walnut street.
3:6qp 9 J. B. McCREARY, President.

SAMUEL BONNELL, JR.,
OFFERS FOR SALE
SUGAR CREEK
LEHIGH COAL,
Delivered on board vessels at Pier No. 4, Elizabethport, N. J.
Office, 43 & 45 Trinity Building, 111 Broadway N. Y. 1:3 qp9

HECKSCHER, BOWNS & CO.,
NO. 111 BROADWAY,
ROOM 79 (TRINITY BUILDING), NEW YORK.
Offer for sale the following Coals at the lowest market rates:
GLENDON COAL COMPANY'S
BUCK RIDGE, SHAMOKIN,
BLACK DIAMOND VEIN, RED ASH,
LOCUST MOUNTAIN, WHITE ASH.
Agents for the celebrated "Hartford Co. Coal."
vol2 5:1

STEAM PUMPS.

J. CLAYTON'S
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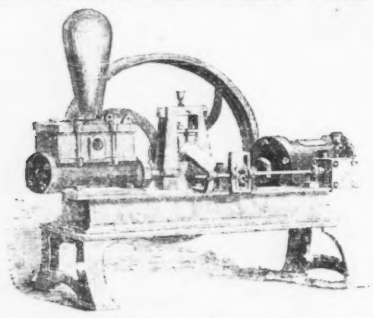

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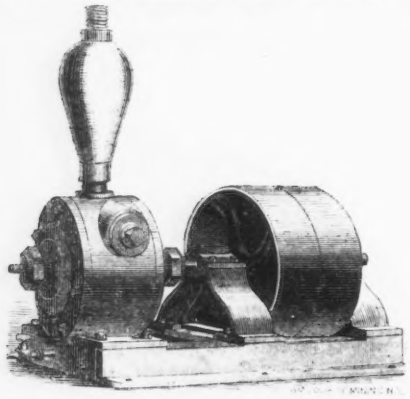

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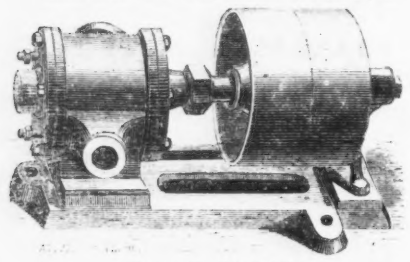

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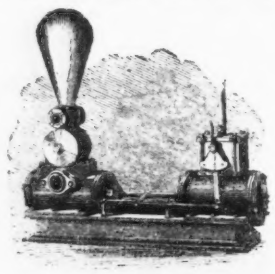

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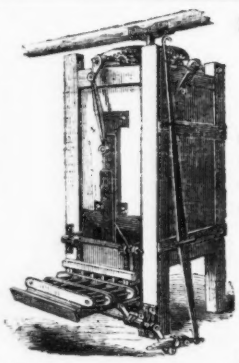

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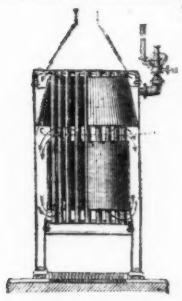

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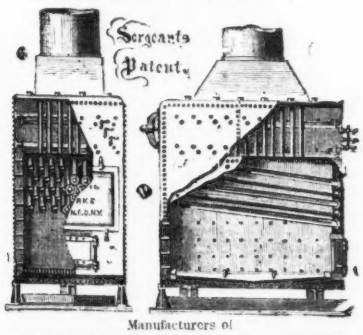

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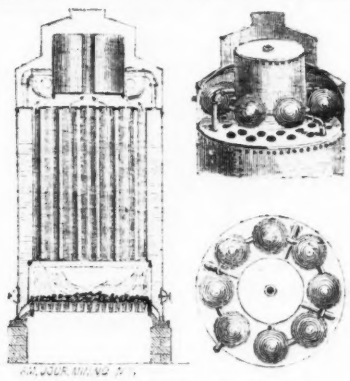

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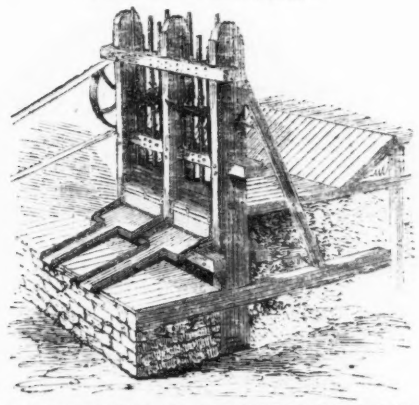

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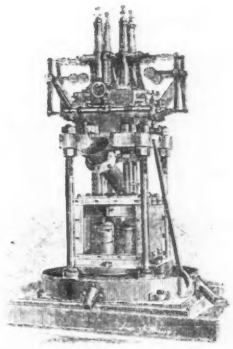

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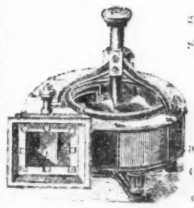

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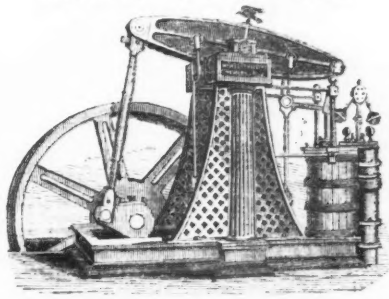

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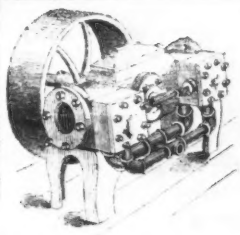

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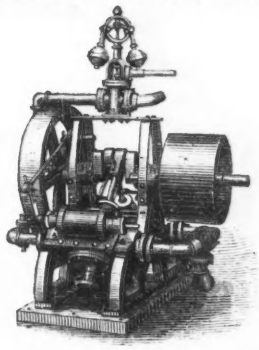

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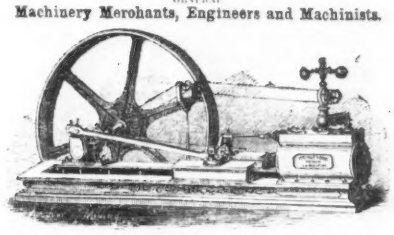

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November 23, 1867.

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Prof. Harper, New York, etc. oct12, '67:6m

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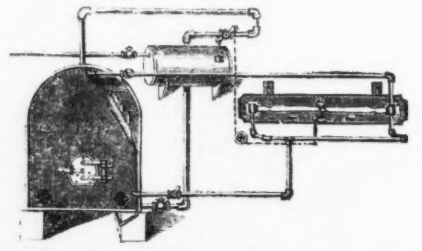

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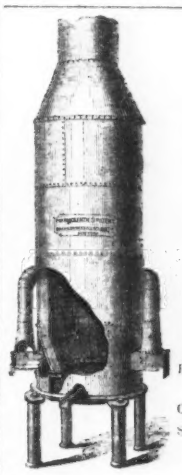

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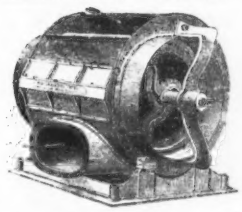

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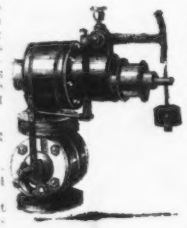

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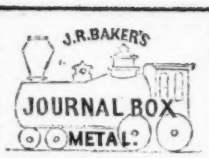

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